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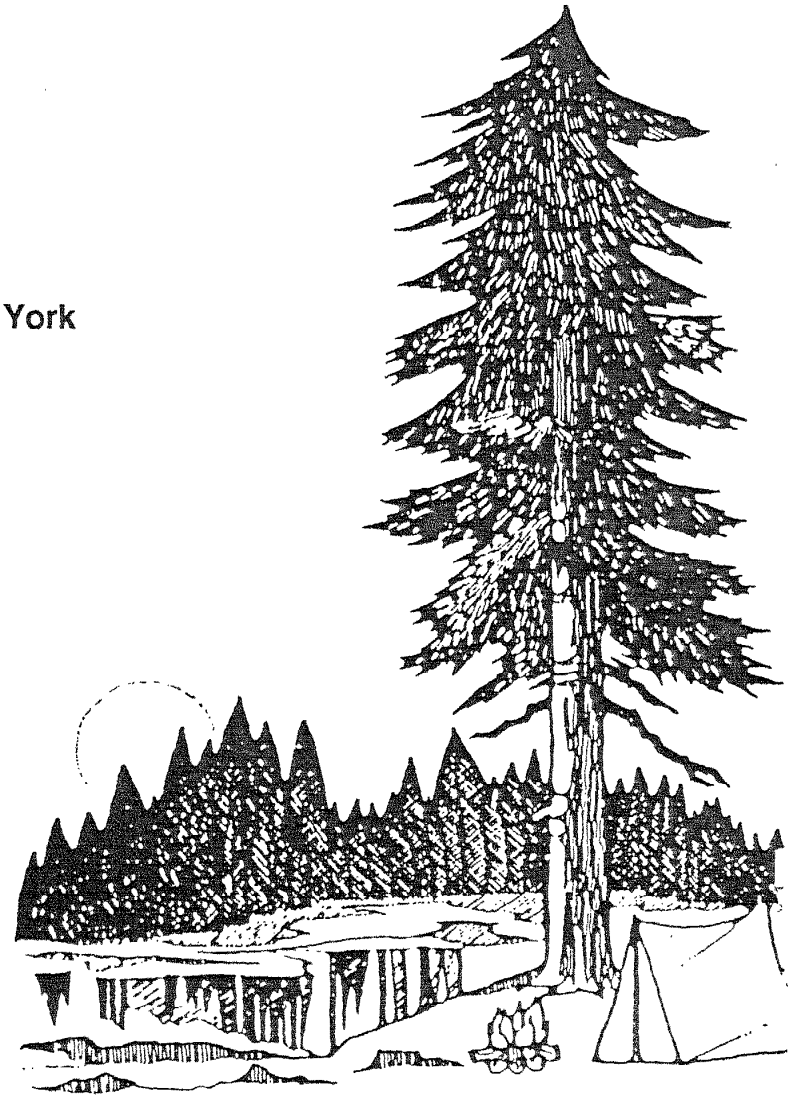

NORTHEASTERN RECREATION RESEARCH MEETING POLICY STATEMENT

The Northeastern Recreation Research meeting seeks to foster quality information exchange between recreation and travel resource managers and researchers throughout the Northeast. The forum provides opportunities for managers from different agencies and states, and from different governmental levels, to discuss current issues and problems in the field. Students and all those interested in continuing education in recreation and travel resource management are particularly welcome.

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PROCEEDINGS of the 1991 NORTHEASTERN RECREATION RESEARCH SYMPOSIUM

April 7-9, 1991
State Parks Management and Research Institute
Saratoga Springs, New York

Compiled and Edited by:

Gail A. Vander Stoep, University of Massachusetts

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OUTDOOR RECREATION

OUTDOOR RECREATION I

AN EXPLORATORY STUDY OF THE CHANGES IN BENEFITS SOUGHT DURING AN OUTWARD BOUND EXPERIENCE

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Participants in an eight-day Outward Bound program were asked about their motivations for participation before the experience began and at the mid-point of the actual experience. Although more anticipated differences were expected, based on motivational theory, only one of the twelve motivational domains was significantly different at the .001 level.

Introduction

As Clawson and Knetsch (1969) pointed out over two decades ago, the actual outdoor recreation activity on the site is not the total recreation experience. Instead, Clawson and Knetsch identified five distinctly different, major phases associated with an outdoor recreation experience. An outdoor recreation experience begins with *anticipation*, including planning. Thinking and planning may be very brief and spontaneous, or may range over several days, weeks or months. "Anticipation may far outrun the later reality. Pleasurable anticipation is almost a necessity . . . . But excessive optimism in the anticipatory stage may lead to later disappointment and frustration" (Clawson and Knetsch, 1969:33). Clawson and Knetsch stress that the outdoor recreationist's advance planning needs to be based upon realistic factors. When anticipation and planning lead to a positive decision, the outdoor recreation experience progresses further. The second major phase is *travel to* the actual site. *On-site* experiences and activities are the third major phase of the total recreation experience. These are activities and experiences engaged in on-site and the satisfactions derived from those activities and experiences. *Travel back* is the fourth phase. The fifth major phase of the total recreation experience is *recollection*. Clawson and Knetsch describe the recollection phase occurring after the experience is over, when the person (or persons) concerned recalls to memory one or more aspects of the total experience, and may share these recollections with friends, relatives, and associates. "When the total recreation experience makes a major impression the recollection will be strong and lasting. If the experience is a brief and common one quickly followed by a similar one, then each experience will make only a dim impression (Clawson and Knetsch, 1969:35). Recollection of an outdoor recreation experience can provide a starting point for anticipation of another. Over time, recollection of many experiences builds into knowledge, or assumed knowledge, thus providing a foundation for choosing among different outdoor recreation sites and activities. Clawson and Knetsch state, "In many ways, the whole outdoor recreation experience is a package deal; all parts are necessary, and the sum of satisfactions and dissatisfactions from the whole must be balanced against total costs. Pleasurable parts of the experience must more than balance the unpleasant parts, if any, if the same experience is to be repeated" (Clawson and Knetsch, 1969:35).

Manning points out that early empirical research in outdoor recreation was primarily descriptive, "focusing on the activities and socio-economic and cultural characteristics of users, and their attitudes and preferences about management" (Manning, 1986:79). Our understanding of outdoor recreation has evolved from this early "activity approach" to a "behavioral approach" which examines why people participate in recreation activities and the experiences gained from such participation. Experiences derived from participation in recreation activities have been prone to a variety of terms such as motivations, satisfactions, benefits sought, psychological outcomes, and experience expectations. The term "motivations" will be used throughout this paper for the sake of consistency. A behavioral approach defines recreation as "an experience that results from recreational engagements" (Driver and Tocher, 1970). Research in recreation activity choice has been dominated by this behavioral approach which theorizes most human behavior as goal-directed, or aimed at some need satisfaction (Driver and Tocher, 1970; Manning, 1986). Grounded in social-psychological expectancy value theory, a behavioral approach suggests that people engage in activities in specific settings to realize a group of psychological outcomes, motivations, satisfactions (Atkinson and Birch, 1972; Lawler, 1973; Fishbein and Azjen, 1974), or multiple satisfactions (Hendee, 1974). Manning states, "Thus, people select and participate in recreation activities to meet certain goals or satisfy certain needs, and recreation activities are more a means to an end than an end in themselves" (Manning, 1986:80). Motivations for outdoor recreation are diverse and are related to the attitudes, preferences, and expectations of users.

An expanded view of the behavioral approach acknowledges four levels of demand for outdoor recreation: Level 1 represents demands for activities themselves; Level 2 demands represent the various settings in which activities take place; Level 3 demands represent people's participation in activities in different settings to realize multiple experiences—satisfactions, motivations, or desired psychological outcomes; Level 4 demands represent the ultimate benefits which emanate from satisfying experiences derived from recreational participation (Manning, 1986:80-81). Such benefits may be either personal or societal, and are individually defined. As such, these benefits are rather abstract and difficult to measure (Manning, 1986). Consequently, empirical study of the behavioral approach to outdoor recreation has focused on Level 3 demands—people's motivations for recreation participation. Empirical tests of the behavioral approach to outdoor recreation indicate there are a variety of motivations for participating in outdoor recreation, and these motivations can be empirically identified (Manning, 1986). Potential recreation motivations are often measured empirically by a series of scale items which represent reasons for deciding to participate in a designated recreation activity (Driver, 1977). These scale items are usually then reduced through cluster analysis to dimensions which can be combined, because of a common underlying theme, to represent domains of more generalized categories of motivations. The goal-directed nature of behavior is the central concept defining the recreation research understanding of motivation.

Kuentzel (1990) points out some of the drawbacks of a goal-oriented approach to outdoor recreation participation by citing

past empirical research. Kuentzel states that response to motive scales may be socialized expressions of popular ideology, rather than a purposeful and articulated calculation of preferences and option (Kuentzel, 1990:2). Kuentzel identifies the following potential problems in the empirical use motive scales: motive scales are insensitive to the measurement of relative motive intensity, the levels of specificity and the semantic interpretation of motives between different people; motive measurement tools cannot reflect the complex nature of a decision-making process; and motive scales cannot predict differences among participants in the same activity at distinctly different settings. Additionally, Kuentzel suggests the expectancy value approach may be deficient in explaining the complexities of motivated behavior in outdoor recreation settings. Kuentzel's analysis suggests that "scaled measurements of motives using a goal-directed approach yield a rather generic description of behavioral phenomena in recreation participation. While these outcome measures can show differences in value and preference, they are not exclusive differences, and do not extricate substantial differences between experiences at different settings and among different activities" (Kuentzel, 1990:12-13).

According to Kuentzel, this motive uniformity conclusion calls for a more detailed refinement of motivation research, with a more careful distinction between experience and outcome. Kuentzel calls for a "process-oriented" approach to recreation behavior, an approach which treats the expressive doing of an activity rather than "the cognitive calculations of benefits versus cost as the motivator for participation" (Kuentzel, 1990:13). While expectancy value theory provides an understanding of attitudes, a phenomenological, process-oriented approach provides an understanding of the expressive action characteristic of recreation participation. Phenomenology recognizes that people may have different perceptions of the same event and essentially draws upon the experiences of individuals as they perceive them, the meaning of these experiences to them and their resultant feelings (Hamilton-Smith, 1990). Utilizing such an approach, people dynamically recreate the meaning of a motive in doing the actual recreational activity. "The motive takes on meaning only as it unfolds within the context of the interaction with the recreation experience, not through retrospective evaluation and objectification" (Kuentzel, 1990:16). Motives exist as entities tied to phenomena external to the individual. An individual draws on an external reality to explain or justify their behavior. A recreationist interactively recreates the meaning of a motive or alters it according to the progressive path of interaction with the recreation experience.

Purpose of Study

Taking this phenomenological, process-oriented approach into consideration, one might expect motivations to change, to be altered through participant interaction, over the course of a recreational experience, especially one that occurs over an extended period of time. The notion of time along with location at which motivations are measured are additional methodological issues as identified by Manning (1986). Thus, the purpose of this exploratory study was to measure motivational changes over the course of a recreational experience lasting over an extended period of time.

Methodology and Research Design

As part of a larger study, 35 college students, participating in an 8-day Rio Grande Outward Bound program involving a variety of outdoor activities such as whitewater canoeing, hiking, rock climbing, camping and outdoor living skills, were asked to rate the relative importance of 40 potential reasons or motivations for participation. The students were asked to complete the motivation questionnaire twice; the first time approximately two and a half weeks prior to the actual on-site experience, and the second time, four days into the actual 8-day experience.

Survey Design

Driver and associates (1977 and 1983) developed a highly comprehensive list of potential recreation motivations, or reasons for deciding to participate in a designated activity, measured empirically by a series of scale items. This item pool for Recreation Experience Preference (REP) scales is designed to quantify the psychological outcomes desired and expected from recreation participation. Respondents are asked to rate the relative importance of each scale item representing a potential motivation for participating in a designated activity. As previously discussed, these scale items are usually then reduced through cluster analysis to dimensions which can be combined, because of a common underlying theme, to represent domains of more generalized categories of motivations. For the purpose of this study, 11 of Driver's REP domains were included which seemed most appropriate for this particular outdoor recreation experience, along with a twelfth domain which we entitled Fun. Altogether, 40 statements, or scale items, were included in the questionnaires to measure the 12 REP domains.

There are two approaches to utilizing these REP dimensions: 1) each dimension in a preference domain can be used separately to examine specific aspects of the central theme of the preference domain. Driver calls this a molecular approach to domain inquiry, i.e. within the Achievement-Stimulation Domain we could look at the specific dimension of Reinforcing Self-Image, Social Recognition, Skill Development, Competence Testing, or Seeking Stimulation; 2) one could take representative items from each component dimension, i.e. Reinforcing Self-Image, Social Recognition, Skill Development, Competence Testing, and Seeking Stimulation, and combine them to define a single dimension representing the entire central domain theme—i.e., in this case, Achievement-Stimulation. Driver calls this a molar approach to domain inquiry and this second approach is utilized here in this study. Table 1 (see next page) shows the 40 statements, or scale items, representing certain underlying motivational dimensions, which are then combined to reflect domains of more generalized categories of motivations.

Data Collection

During the Anticipation Phase of the Outward Bound course experience, each student completed a questionnaire which asked them to rate the relative importance of the 40 statements related to potential reasons for participation by completing the following sentence, "I'm participating in this Outward Bound program because I want to . . . ." The relative importance of each statement was indicated by each student utilizing a 5-point Likert Scale where 1=Not At All Important to 5=Extremely Important. During the Experience Phase, a second questionnaire was administered which asked each student to indicate how important each of the potential reasons for participation was for the rest of the experience by completing the following sentence, "For the rest of my Outward Bound program I want to..." Once again, the relative importance of each statement was indicated by each student utilizing the same 5-point Likert Scale.

Treatment of Data

Utilizing data generated from the two questionnaires, and applying the molar approach to domain inquiry as discussed above, reliability levels (Cronbach alpha) were computed for the REP domains. Table 1 shows the reliability coefficient for

Table 1. Reliability coefficients for 12 recreation experience preference domains.

RECREATION EXPERIENCE PREFERENCE DOMAIN Dimension scale item/statement	Anticipation Phase	Experience Phase	Range of Estimated Cronbach alpha for All Items in Dimension[a]
ACHIEVEMENT-STIMULATION	.57	.86	.94 - .96
Reinforcing Self-Image			
show myself that I can do it			
Social Recognition			
show others that I can do it			
Skill Development			
develop new skills			
improve my skills			
Competence Testing			
learn what I'm capable of			
Seeking Stimulation			
experience excitement			
LEADERSHIP/AUTONOMY	.83	.73	.88 - .90
Independence			
feel my independence and be on my own			
Autonomy			
be free to make my own choices			
Control-Power			
be in control of things that happen			
have others direct me/be in charge			
RISK TAKING	.71	.90	.70 - .81
take risks			
take chances in dangerous situations			
experience uncertainty of not knowing what will happen			
LEARNING-DISCOVERY	.65	.78	.88 - .91
General Learning			
learn about and get to know a new area			
Exploration			
experience new and different things			
RELATIONSHIPS WITH NATURE	.86	.86	.92 - .95
Scenery			
view the scenic beauty			
General Nature Appreciation			
get a feeling of harmony with nature			
gain a better appreciation of nature			
REFLECT ON PERSONAL VALUES	.55	.89	.88 - .91
Spiritual			
think about my personal values			
Introspection			
learn more about myself			
PHYSICAL FITNESS-EXERCISE	.57	.83	.86 - .93
improve my physical health			
be physically active			
ESCAPE PERSONAL-SOCIAL PRESSURE	.54	.78	.91 - .93
Tension Release			
be able to release built-up tensions			
Slow Down Mentally			
recover from my usual hectic pace			
Escape Role Overloads			
get away from the usual demands of life			
Escape Daily Routine			
do something different			

[a] From: Driver, B.L. 1977. Item Pool for Scales Designed to Quantify the Psychological Outcomes Desired and Expected from Recreation Participation. Range of Cronbach alpha from past empirical studies.

Table 1 (Continued). Reliability coefficients for 12 recreation experience preference domains.

RECREATION EXPERIENCE PREFERENCE DOMAIN Dimension scale item/statement	Anticipation Phase	Experience Phase	Range of Estimated Cronbach alpha for All Items in Dimension[a]
ESCAPE PHYSICAL PRESSURES	.73	.85	.94 - .96
Tranquility			
experience solitude			
experience peace and calm			
Privacy			
be alone			
get away from certain people			
Escape Crowds			
experience open space			
get away from civilization for awhile			
Escape Physical Stressors			
get away from my current routine			
ESCAPE FAMILY/FRIENDS	single	single	.65 - .78
be away from my family/friends for awhile	item	item	
RISK REDUCTION	.76	.81	(not available)[b]
Risk Moderation			
be near others who could help if I need them			
know others are nearby			
Risk Avoidance			
be sure of what will happen to me			
FUN	.89	.95	(not available)[c]
enjoy myself			
have a good time			
have fun			

[a] From: Driver, B.L. 1977. Item Pool for Scales Designed to Quantify the Psychological Outcomes Desired and Expected from Recreation Participation. Range of Cronbach alpha from past empirical studies.

[b] From: Driver, B.L. 1983. Master List of Items for Recreation Experience Preference Scales and Domains.

[c] Twelfth domain added in this study.

each domain during each phase of the study and the range of reliability coefficients from past empirical studies. Reliability levels were found to be satisfactory, although the Cronbach alpha coefficients for Achievement-Stimulation, Reflect on Personal Values, Physical Fitness-Exercise, and Escape Personal-Social Pressure were found to be low for the Anticipation Phase. We do not have an explanation for these low reliability coefficients during anticipation.

Analysis and Findings

Means were computed for both the Anticipation Phase and Experience Phase. Statistical analysis involved performing t-tests on the paired data for the difference of means between these two phases, with regard to the 12 Recreation Experience Preference domains. No statistically significant differences were found for 11 of the 12 Recreation Experience Preference domains (See Table 2, next page).

One domain, Escape Family-Friends, represented by the statement "get away from my family/friends for awhile" approached significance at the .05 level (p=.054). The domain of Risk Reduction was found to be significantly different for the Anticipation and Experience Phases (p=.000). This domain was represented by the dimension of Risk Moderation, which included the scale item statements of "be near others who could help if I need them" and "know others are nearby" and by the dimension of Risk Avoidance, which included the scale item statement of "be sure of what will happen to me." It appears that the students participating in the Outward Bound program considered the domains of Escape Family-Friends and Risk Reduction to be significantly more important during the Experience Phase than during the Anticipation Phase.

Discussion and Conclusion

The one significant difference found could be expected, given some of the objectives of an Outward Bound program—stressing the importance of developing each individual's ability to cooperate with others in the group, learning and applying the concepts of teamwork in decision-making and problem-solving situations, building group interdependence, and increasing an individual's awareness of others—all of which contribute to risk reduction in an Outward Bound experience. The increased importance of escaping family/friends back at home or school during the Experience Phase also could be expected given the Outward Bound objectives stated above. For practitioners, in this case Outward Bound instructors, it appears it is possible to "manage the experience" in such a way that the "group" becomes more important for individuals as the experience evolves over an extended period of time.

However, based on the work of Manning (1986), Kuentzel (1990), and others, more statistically significant differences in the Recreation Experience Preference domains between the Anticipation Phase and the Experience Phase had been expected in this study. As motivational theory regarding recreational experience evolves, it may well be that motivations are not only constant across certain activities, but that motives actually remain relatively stable across the various phases of these outdoor recreation experiences.

This study examined one Outward Bound program, an 8-day experience in which 35 college students participated in various recreational activities, and thus, it will take further efforts in this area to determine whether the study results can be generalized to other activities, and to even similar experiences under different situations, of varying intensity and of various duration.

Table 2. T-tests for the difference between anticipation and experience phases with regard to 12 recreation experience preference domains.

Recreation Experience Preference Domain	Mean Anticipation Phase[a]	Mean Experience Phase[b]	t-value	p-value
Achievement-Stimulation	3.97	3.92	.31	.761
Leadership/Autonomy	3.21	3.31	- .84	.409
Risk Taking	3.37	3.54	-1.23	.228
Learning-Discovery	4.33	4.23	.63	.536
Relationships with Nature	4.19	4.08	.81	.424
Reflect on Personal Values	3.97	3.73	1.15	.259
Physical Fitness-Exercise	3.74	3.73	.08	.934
Escape Personal-Social Pressure	3.55	3.61	-.42	.680
Escape Physical Pressures	3.44	3.40	.32	.748
Escape Family/Friends	2.06	2.57	-2.00	.054
Risk Reduction	2.28	3.08	-4.67	.000
Fun	4.47	4.44	.16	.876

[a] Computed means based on a five-point Likert Scale where 1=Not At All Important, 2=Somewhat Important, 3=Moderately Important, 4=Very Important, 5=Extremely Important.

[b] Computed means based on same five-point Likert Scale as above.

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BLACK/WHITE OUTDOOR RECREATION PREFERENCES AND PARTICIPATION: ILLINOIS STATE PARKS

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Black/white comparisons of outdoor recreation preferences and behavior from a statewide survey identify a significantly greater black orientation to "developed sites" and "social interaction." Strategies are recommended to enhance outdoor recreation opportunities for blacks, and long-term research needs are identified.

Outdoor recreation planners face major challenges in meeting the needs of "minority groups." Understanding the needs of these diverse groups has been difficult for recreation planners and managers because few minorities are on recreation staffs, and minorities have not always been active in recreation planning and public involvement efforts. The problem is especially complex for those concerned with resources outside urban areas who do not know why there is often limited minority use of the areas or what to do differently to enhance opportunities for minority groups. The limited research to date suggests significant differences in recreation preferences and behavior among some racial and ethnic groups that have implications for how we plan for outdoor recreation sites, but there is a need for additional information to guide recreation plans and programs.

This paper focuses on the outdoor recreation preferences and participation of blacks and whites as expressed in a statewide survey. Limited observations preclude the inclusion of Hispanic, Asian, and other minority groups in the analysis. Our approach is to (1) identify black/white differences in recreation preferences and behavior, (2) explain these differences, and (3) discuss the implications for outdoor recreation planning and research. We believe comparisons with whites can be a starting point for efforts to better serve blacks because outdoor recreation planners are most familiar with the recreation behavior and preferences of whites.

The Earlier Study

A previous comparison of the outdoor recreation participation and preferences of black and white Chicago households based on data for 1976 identified a number of similarities and differences (Dwyer and Hutchison 1990). One finding with important implications for planning outdoor recreation sites was a stronger black inclination to select "developed facilities and conveniences" rather than "preserved natural areas" as the more important consideration in developing new recreation areas for people. In addition, when asked whether they view outdoor recreation as an opportunity to "visit or meet new people" or for "getting away from a lot of other people," blacks were more likely than whites to select "meet people." In both instances the black/white differences were statistically significant (.05 level) in simple comparisons as well as when individual and household characteristics were taken into account. Black/white differences in activity participation also suggested a greater black orientation to "developed sites" and "meeting people."

The Present Study

A recent survey (1988) of Illinois adults makes it possible to further explore the recreation orientation of blacks to "developed sites" and "meeting people." The focus of the present effort is on a particular resource -- Illinois State Parks -- and there is a range of responses to support the analysis, as well as additional information on the characteristics of individual respondents, their household, and their location to help interpret responses. This provides for a more focused and stronger analysis than in the earlier study.

The present study is based on data collected for 1987 as part of the Illinois Statewide Comprehensive Outdoor Recreation Planning process. The Survey Research Laboratory of the University of Illinois conducted telephone interviews with 1,015 randomly selected adult residents of Illinois for the Illinois Department of Conservation. Information was obtained on participation in 32 outdoor activities, overnight trips taken within and outside Illinois where an important part of the trip was to enjoy the outdoors, usage of parks and other outdoor facilities, satisfaction with state park facilities, and attitudes on methods for funding state parks. Important limitations on the analysis imposed by the data include the small number of black American respondents (125); the individual, household, and locational characteristics that were gathered; the questions that were asked; 32 activities for which participation data were gathered (one, "other outdoor game/sport," was not used because it was too broad to interpret). The limited number of blacks in the sample restricted the spatial breakdowns of residence to Chicago, Chicago suburbs, and the remainder of the state. Social background variables included family income (4 categories), age of the adult respondent (5 categories), gender, number of individuals in the household, and number of adults in the household.

When the recreation preferences and behavior of blacks and whites are compared, there is a fundamental question of whether the differences are due to culture or to other dimensions. The question often asked is "What differences would there be if we were able to base the analysis entirely on interviews with blacks and whites who were similar in all other respects except for race?" Because black and white respondents often differ along a number of dimensions in addition to race, it is often useful to look at black/white differences in a broader context with these other variables accounted for.

Probit and logit models were used to account for other variables (including individual, household, and locational characteristics) in the analysis of black/white differences. The probit model was used when the response involved two choices; the logit model was used when there were more than two choices. The models tell us whether race and each of the social background variables are significantly associated with the response when all variables are accounted for jointly.

Black respondents were more likely than whites to be from Chicago, to be in the lower categories of household income, and to live in households with a large number of individuals but a small number of adults. These differences explain a number of black/white differences in outdoor recreation participation when considered jointly with all other social background characteristics of respondents.

Main Purpose of the State Park System

When asked to choose between "protect natural resources" and "provide recreation for people" as the main purpose of the Illinois State Park System, blacks were significantly more likely than whites to select "to provide recreation for people" (i.e., 52 percent of blacks, 25 percent of whites)(Table 1). This difference remained significant when all other individual, household, and locational variables were accounted for, with race the only variable out of the set that had a significant association with the choice. These results appear consistent with 1976 survey findings that blacks were significantly more likely than whites to select "developed facilities and conveniences" rather than "preserved natural areas" as more important when developing new recreation areas for people.

Table 1. What should be the main purpose of the Illinois State Park System?

	Percent	
	Black	White
To protect natural resources	38	65
To provide recreation	52	25
Both	6	9
Don't know	3	1

Overall black/white difference significant at .05 level.

Important Attributes of State Parks

When users were asked about the importance of state park attributes, blacks and whites gave similar responses to 11 of 12 attributes presented to them. However, blacks were significantly more likely than whites to rank "has organized events" as very important (blacks = 63 percent, whites = 10 percent) (Table 2). This difference was also significant with all other variables accounted for, and race was the only variable that had a significant association with responses concerning the importance of this attribute. Organized events can be viewed as having a social or "meet people" dimension, and the greater importance of this attribute for blacks can be interpreted as consistent with the earlier finding that blacks were more likely than whites to view outdoor recreation as an opportunity to "visit or meet new people" rather than for "getting away from a lot of other people."

When all other variables were accounted for, blacks were significantly more likely than whites to indicate that "has camping facilities" was an important attribute of state parks. This result was closely tied to the number of adults in the household, indicating that the lower number of adults in black households may have limited the importance they attached to opportunities for camping at state parks (Table 2).

Activities Engaged In at State Parks

Blacks were significantly less likely than whites to hike on a state park trail (55 percent of whites, 27 percent of blacks), but significantly more likely than whites to play ball or other games at a state park (73 percent of blacks, 35 percent of whites) (Table 3). The significantly higher black participation in "playing ball or other games" would seem consistent with the "provide recreation" orientation and perhaps a preference for "organized events" by black respondents. With all other variables accounted for, the significantly higher black participation in "playing ball and other games" at state parks remains; but the black/white difference in hiking on trails drops from just above to just below the level of significance, and a significant black/white difference in fishing at state parks emerges. When all variables were considered jointly, fishing at state parks was more likely among those who live in areas outside Chicago. The concentration of blacks in Chicago apparently tends to suppress their fishing activity at state parks (Table 3).

Table 2. Percent of Illinois State Park users indicating that specified park attributes were very important to them.

	Black	White
Is clean and well maintained	95	97
Is safe	100	91
Has parking facilities	86	80
Special natural features/scenery	81	74
Big enough for variety of uses	77	58
Has a lake or river	73	56
Is not too crowded	59	48
Is close to home	45	44
Has camping facilities	50	29
Has fishing opportunities	36	25
Has organized events	63*	10*
Has hunting opportunities	14	8

* Black/white difference significant at .05 level.

Table 3. Activities engaged in by adults at Illinois State Parks in the previous 12 months.

	Percent Participating	
	Black	White
Picnic	86	2
Hike on a trail	27*	55*
Photograph the scenery	36	41
Play ball or other games	73*	35*
Birdwatch	23	24
Fish	32	20
Camp overnight	18	18
Horseback ride	9	4
Use overnight facilities	9	4
Hunt	5	2

* Black/white difference significant at .05 level.

Black/white differences in responses concerning activities engaged in at state parks were generally consistent with participation patterns in the 31 activities (not limited to state parks) included in the analysis. Out of 31 activities, blacks were significantly more likely than whites to participate in 3 -- all of which are outdoor sports (softball/baseball, outdoor basketball, and soccer). These three activities are generally consistent with an orientation to "developed sites," "organized events," and "meeting people." Whites were significantly more likely than blacks to participate in 15 activities, many of which tend to be associated with water, snow or ice, and natural environments. These activities are likely to be associated with a "natural environment," an absence of "organized events," and opportunities for "getting away from people." Controlling for social background variables reduced the number of activities where there was a significant black/white difference from 18 to 10. However, the same overall pattern remains: blacks are more likely than whites to participate in softball/baseball, and whites more likely than blacks to participate in activities oriented to water, snow and ice, and natural environments.

Choice of State Parks

When respondents were presented with "to enjoy natural surroundings" or "to enjoy outdoor activities made possible by park facilities" as reasons why they use Illinois State Parks, there were no significant black/white differences in the responses, either in a simple comparison or with all social background variables accounted for. Although the lack of a black/white difference in reasons for using state parks appears somewhat inconsistent with the greater orientation of blacks to "provide recreation for people" as the main purpose of the State Park System, ball playing at a State Park, and the interest in "organized events" at state parks, it was entirely consistent with the similar importance attached to a wide range of "developed" and "natural" park attributes by blacks and whites (Table 2).

Blacks were significantly less likely than whites to report that they used a state park or other state-operated recreation areas in Illinois in the previous 12 months (18 percent of blacks, 33 percent of whites). There was, however, no significant difference in the average days of use per year by blacks and whites who used these areas (7 days for blacks and 5 days for whites). When social background variables were accounted for, the black/white difference in percent using state parks or other state-operated recreation areas in Illinois was not significant. Use of these resources tends to be associated with residence outside Chicago and high household incomes.

The responses concerning use of state parks are part of a general pattern of blacks tending to concentrate their outdoor recreation activities in areas close to home such as vacant lots or streets, city or county parks, forest preserves, or school yards in Illinois, rather than in more distant areas or clubs or commercial facilities. In addition, when a wide range of areas was considered, black/white differences tended to be greatest in the likelihood of using an area rather than in the number of days of activity by users (i.e., blacks may be less likely to use a type of facility, but black and white users spend a similar number of days at the facility). There were no significant black/white differences in the average days of use by users of any of the types of areas.

When asked the main reason why they haven't visited an Illinois State Park in the past 12 months, blacks and whites tended to give similar responses to the list of choices presented. There were no significant differences in any of the response categories.

Discussion

When individual, household, and locational variables were accounted for, significant black/white differences in recreation behavior and preferences remained. These differences include a greater black orientation to "providing recreation for people" rather than "protect natural resources" as the main purpose of the State Park System, a greater black inclination to select "has organized events" and "has camping" as important attributes of an Illinois State Park, a greater probability than whites for engaging in outdoor sports at Illinois State Parks and in general (i.e., regardless of the location), and a greater probability of blacks engaging in fishing at Illinois State Parks.

Suggestions For Planners

Planners interested in increasing the outdoor recreation opportunities for blacks in Illinois might consider the suggestions presented below which focus on changes in current efforts to better accommodate those needs of blacks that differ from those of whites. These suggestions must not be interpreted as encompassing all that should be done to meet the needs of blacks (i.e., we must avoid stereotyping blacks by their differences from whites or treating blacks as a homogeneous group). There may be several activities that blacks do not currently engage in and would like to, as well as many kinds of areas that blacks would like to use but currently do not. There are also a great many similarities in outdoor recreation preferences and behavior of blacks and whites, and a number of plans and programs will serve the needs of both groups.

Sites close to home. Because of the significant concentration of blacks in Chicago (and other large cities) and possible limitations on their travel (lower incomes, large families, few adults, fear of discrimination); emphasize the creation and upgrading of outdoor recreation sites in and near Chicago and other large cities.

Facilities for sports. Since some blacks have a significant orientation to outdoor sports such as softball, baseball, and soccer, provide opportunities for these activities at outdoor recreation areas.

Special events. Given the importance that some blacks place on "has special events" at state parks, undertake a program of instituting, expanding, and publicizing such events at state parks and other outdoor recreation areas throughout Illinois, especially near large urban centers such as Chicago.

Low fees. Because low incomes and large numbers of individuals in some black households appear to restrict recreation activity, keep fees and charges low at outdoor recreation areas, and look to economical ways of providing equipment and supplies.

Discrimination. Other studies have shown that discrimination is a key problem that limits the recreation behavior of some blacks (West 1989). Fear of discriminatory behavior may well contribute to the urban-oriented patterns of recreation behavior by many blacks that is reported here. Promising ways of overcoming this may be to have black personnel working at the recreation facility and to encourage large group outings such as church groups.

Group programs. Given that large household sizes and limited number of adults appear to limit the recreation outings of some black households, provide for group outings where mutual support is fostered, and offer guided tours and other programs for children at outdoor recreation areas. These efforts could help overcome some of the barriers to camping at state parks.

Build on similarities as well. Black/white similarities in recreation participation and behavior include similar likelihoods of participating in 8 of 10 activities at Illinois State Parks (Table 3), the attachment of similar importance to 11 of 12 attributes of Illinois State Parks (Table 2), similar probabilities of using four of seven types of outdoor recreation resources, similar probability of participating in 18 of 31 activities, and similar days of participation among participants in 23 of 31 activities, as well as similar responses concerning the importance of barriers to use of state parks. Given these and other similarities in black and white outdoor recreation preferences and behavior, many actions would enhance recreation opportunities for both blacks and whites.

Suggestions for the Longer Term

In the longer term, it is important to look beyond current patterns of behavior, crude measures of preferences, and simple comparisons with whites to learn more about the perceptions,

preferences, and desired outdoor recreation behavior of blacks and other important groups.

Variations within the black population. To avoid stereotyping blacks by their group averages or their differences from whites, explore more fully the wide range of recreation areas used and activities engaged in by blacks. This can follow up on the efforts of Woodard (1988) and Taylor (1991) and must give careful attention to the identification of outdoor recreation from the perspective of blacks. Additional attention should be given to the site preferences of blacks. Variations in recreation behavior and preferences among blacks should be explored, including different ethnic groups within the black race, such as Jamaicans, African Americans, and others.

Learn from those who break the stereotypes. If our interest is in making certain that a wide range of opportunities is available to blacks, there may be a great deal to learn from blacks who participate in activities with traditionally low levels of black participation or use remote natural areas where blacks are seldom found. Organizations made up of black participants in some of these activities could be involved in the research. How did black individuals get started in the activity? What barriers did they need to overcome? Where do they get information about opportunities to participate? What do they think might encourage other blacks to participate in the activity? What are their suggestions for planning and management of opportunities for the activity? Is there need for additional information about opportunities? How should that information be disseminated?

Barriers to use of areas. Although blacks and whites gave similar responses to a list of reasons for not using state parks, additional work is needed to explore the barriers to participation in activities or use of areas. A fundamental dimension of the black/white differences in recreation participation is a greater urban orientation of blacks. Blacks tend to live in urban areas, concentrate a substantial amount of their recreation activity in urban areas, engage in the kinds of activities that can be participated in the urban environment, and express preferences for the kinds of developments at state parks that are often associated with an urban environment, such as facilities for recreation and "special events." Part of this orientation appears to be a function of historical developments and relatively low incomes and mobility, but signs of this urban - oriented pattern exist even when those variables are accounted for. West (1989) suggests that fear of discrimination inhibits black recreation participation -- particularly travel, but we lack information about discrimination and other barriers. To what extent is lack of information about opportunities a problem?

The concept of barriers may be useful in explaining a number of differences. Black/white differences in the percent participating in individual activities are far more significant than is the case with average number of days of participation in Illinois by participants in particular activities. There was a similar finding with the 1976 data. Similarly, black/white differences in portion of each group using particular facilities are far more significant than the number of days of participation in Illinois by black and white users of particular facilities. There are far greater differences in black/white responses concerning the purpose of the State Park System than in reasons for selecting individual parks by those who use the system. Thus the major differences are whether an individual engages in an activity or uses an area, rather than the annual use by participants. This suggests that perhaps barriers to participation are at work and that those who overcome them have participation patterns much like whites who engage in the same activities or use the same areas.

New approaches to gathering information. Analysis of surveys such as the ones on which this paper is based can serve only as a crude tool for planning. Discussions with the black community and its leaders are critical. One approach that we have a great deal of faith in is focus group discussions, and we have or are currently conducting them with college students, community groups, and church groups.

Additional groups. The research should be expanded to other important "minority groups" such as those with Hispanic or Asian origins. Preliminary research suggests that there are substantial differences in recreation behavior between these groups that have significant implications for the management of outdoor recreation resources. By looking at a wide range of groups, we can better understand and improve the recreation opportunities made available to each.

Market segments. The research might also be expanded beyond ethnic groups to define segments of the population with similar recreation preferences and behaviors that could serve as a basis of recreation programs. These segments might consist of combinations of race, ethnicity, age, gender, income, neighborhood setting, access to a personal automobile, and household composition. The analysis presented here suggests that the joint influence of these variables may be more useful in explaining outdoor recreation participation and behavior than race alone.

Summary and Conclusions

The results parallel results from an earlier study and identify a significantly greater black orientation to "developed sites" and "social interaction" that persists when individual, household, and locational variables are accounted for. There are significant black/white differences in activities engaged in at state parks as well as elsewhere in Illinois, and in the kinds of areas used. Some of these differences are reduced in significance when individual, household, and locational variables are accounted for, but others persist.

Planning strategies for increasing the use and enjoyment of outdoor recreation areas by blacks might include developing and enhancing areas near Chicago and other large cities with substantial black populations, providing opportunities for outdoor sports as well as fishing and camping, providing special events, keeping fees and charges low, providing for group outings and programs for children, hiring minority staff and making other efforts to reduce discrimination, and improving the overall quality of opportunities provided.

The development of longer term strategies for enhancing the opportunities made available for blacks must be grounded in further research that includes investigation of the wide range of outdoor recreation activities, behaviors, and preferences of blacks; careful analysis of blacks who do participate in activities or use areas where whites have traditionally predominated and determination of what facilitated their entry into that activity or use of that area; a much more detailed analysis of barriers to the use of recreation resources outside of urban areas, including discrimination, as well as means of breaking down those barriers; an extension of the analysis to other minority groups, and a broader approach to identifying market segments for outdoor recreation planning that consider race and other individual, household, and locational variables.

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THE SPIRITUAL ASPECT OF NATURE: A PERSPECTIVE FROM DEPTH PSYCHOLOGY

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The depth psychology of C. G. Jung provides a set of concepts for exploring the spiritual aspect of nature. According to this view, spiritual experiences occur when basic patterns or archetypes within the psyche are projected onto natural environments. Implications of this viewpoint for natural resource management and research are discussed.

Introduction

There is intense debate about the management of forests in America today. The USDA Forest Service, in response to criticism that it has focused too narrowly on economic values and commodity extraction, has begun a program called "New Perspectives." One purpose of this program is to make forest management sensitive to multiple values, in addition to the economics of timber markets. So far, the discussion of values under New Perspectives has focused mainly on biological values, such as ecosystem diversity, stability, and sustainability. There have, however, been occasional references to a third kind of value. For example, the director of the New Perspectives program states that the wealth of forests "can be measured in economic, ecological, and spiritual terms (Salwasser 1990, p. 32)," and a National Research Council report urges increased support for forestry research so that society can "secure the environmental, economic, and spiritual benefits of forests (National Research Council 1990, p. 58)."

The spiritual value of nature has frequently been celebrated in art, literature, and music (e.g. Fairchild 1989). There has, however, been little serious discussion of this topic by forest managers and scientists. The present crisis in forest management may in part be due to a failure by the forestry profession to understand and respect the strong spiritual values that many people find associated with natural environments. My purpose in this paper is to encourage natural resource researchers and managers to begin looking seriously at the spiritual aspect of nature. I will discuss how spirituality might be defined, present a psychological perspective from which spiritual phenomena can be viewed, and discuss some implications for natural resource research and management.

A Definition of "Spiritual"

Before we can talk about the spiritual aspect of nature, we need to have some notion of what we are talking about. Scientists trained in the natural sciences are often reluctant to talk about spiritual phenomena. Perhaps this is because phenomena such as spirit and soul have traditionally been conceptualized in supernatural terms, a viewpoint rejected by science. It is possible, however, to conceptualize spiritual phenomena in psychological terms that do not require a belief in supernatural entities. When spiritual phenomena are recognized as being psychological in nature, they become a legitimate topic for scientific discussion (Maslow 1974).

In this paper I will outline one approach that psychologists have taken to spiritual phenomena. First, however, I want to offer a tentative definition of what I mean when I use the word "spiritual." This word carries many nuances of meaning and refers to a complex range of phenomena. Any definition must therefore be viewed as provisional and incomplete. Most of the uses of the word that I have encountered in regard to nature, however, can be summed up in the following statement.

"Spiritual" refers to the experience of being related to or in touch with an "other" that transcends one's individual sense of self and gives meaning to one's life at a deeper than intellectual level.

In a spiritual experience, one encounters something larger or greater than one's individual self. The "other" that one encounters need not be conceptualized in traditional religious terms. Depending on the individual, the transcendent other may be seen as a supernatural deity (e.g. God), or as a natural entity (e.g. the Earth). It may be something that exists objectively "out there" (e.g. the process of evolution), or it may be a subjective, inner phenomenon (e.g. creative inspiration). It may originate independently of the human sphere (e.g. wilderness), or it may be a product of human culture (e.g. a community). For some people, the "other" may not be a specific entity at all, but the undefinable "ground of being" that gives rise to all existing things.

Regardless of how it is imaged, the experience of this "other" is more than just a passing, casual occurrence. In some important way the experience gives meaning to one's life and helps to define who one is in relation to the world. The experience of the other is felt at a level deeper than the merely intellectual. It is more than an abstract thought or concept. It may be quite difficult to express in words, but it is felt in the heart and may stir powerful emotions. Experiences of this kind can occur in many contexts and settings, both natural and human-made. For many people, however, natural environments seem to be the primary setting for spiritual experiences.

A Perspective from Depth Psychology

The viewpoint from which I will look at the spiritual aspect of nature in this paper is based on the depth psychology of C.G. Jung. Depth psychology concerns itself with the phenomena of the unconscious mind, which is that part of the human psyche that lies outside the awareness and/or control of the conscious ego. Jung's approach views the unconscious as the medium through which spiritual experiences occur. The book *Man and his Symbols*, edited by Jung (1964), provides a good general introduction to Jungian psychology.

Archetypes

According to Jung, there are different levels or layers to the psyche. Immediately below the level of conscious awareness lies the personal unconscious, which includes personal feelings, attitudes, and memories that have been repressed and remain split off from an individual's conscious ego. At a deeper level is the collective unconscious, which contains basic, instinctive patterns of behavior, emotion, and imagery that are common to all humans. These instinctive patterns, which are called "archetypes," guide and give meaning to our interactions with other people and the world. They are the "other" that people encounter in spiritual experiences.

An archetype functions like a template in the unconscious mind, giving rise to a diversity of symbolic images and expressions that enter consciousness through dreams, myths, religious images, and spontaneous fantasies (Jung 1960). One of the

most important ways in which archetypes express themselves is through projection, a psychological phenomenon in which the contents of the unconscious mind are experienced as if they belonged to someone or something outside of oneself. A classic example of projection is "love at first sight," in which undeveloped, unconscious aspects of an individual's personality are projected onto a stranger, producing a strong feeling of attraction. Projections have been observed and studied most often in the field of interpersonal relationships, but they can occur in other areas too.

From this perspective, we might suspect that spiritual experiences in nature involve the projection of unconscious archetypes onto elements of the natural environment, or onto nature as a whole (Williams 1990). A Jungian psychologist looking at spiritual experiences in nature might then ask what archetypes are being projected, and what implications this has for the individual and the collective psyche.

Mythology

Jungian psychologists often turn to mythology and literature for symbolic portrayals of the archetypes that are active in the collective psyche of a culture. One approach to identifying the spiritual significance of nature therefore might involve an examination of gods and goddesses who have been associated with various aspects of nature. In the Greek tradition this would include Demeter, the goddess of vegetation, fertility, and agriculture; Pan, the rustic deity of woods and fields; and many others. Mythological characters can still capture the imaginations of modern people and are sometimes used to personify the beliefs and values of environmentalists. For example, the moon goddess Artemis, who is associated with forests and hunting, has been nominated as the "Goddess of Conservation" (Hughes 1990), and deep ecologists have adopted the earth goddess, Gaia, as the personification of the whole-earth organism (Lovelock 1979, Devall and Sessions 1985).

To learn about the archetypes underlying the experience of nature, one can also examine the way in which elements of natural environments have been used in the mythological and religious traditions of various cultures. For example, many mythological traditions tell of a symbolic "World Tree" that stands at the center of the universe. The World Tree is the symbolic axis or point of contact that connects mundane earthly existence with the divine (i.e. archetypal) realms above and below the earth (Eliade 1959).

Sacred groves are another common feature in ancient religious traditions (Vest 1983, Hughes 1990). These groves of trees were set aside and dedicated, usually to a goddess. For the Celts such groves provided a link between the mundane and the sacred worlds (Vest 1983), and in this sense their symbolic function was much like that of the World Tree. Sacred groves were considered inviolable, and were protected by civil and religious laws. The modern concern for preserving and protecting wilderness appears to echo this ancient regard for sacred groves. Wilderness managers have been likened to the "Keepers of the Sacred Grove" (Brown and Freed 1990).

Individuation

Jung noted that archetypal symbols and themes arose not only in mythology but also in the dreams and fantasies of individual people. He described several archetypes that characteristically emerged in the course of psychological analysis with his patients. These archetypes are crucial to the process of personal growth and change, a process that Jung called "individuation" (von Franz 1964). A Jungian approach to the spirituality of nature might therefore ask how the archetypes and the process of individuation are expressed in the human-nature relationship.

The most obvious example is the archetype of the Great Mother, a powerful psychological complex that can have either a positive, nurturing effect or a negative, destructive effect on the psychological development of the individual. "Mother Nature" in her benevolent and destructive moods is a personification of this archetype, projected onto nature (Cooper 1978).

Another example is the Anima, which is what Jung called the unconscious feminine side of a man's personality. The Anima is associated with creative, intuitive, and spiritual aspects of life that tend to remain unconscious in many men. The allure and fascination of wild settings may involve a projection of this archetype onto nature. The feminine nymphs and nature spirits that inhabit trees and streams in many mythological and folk traditions can be interpreted as personifications of the Anima.

In Jung's psychology, the guiding force and the ultimate goal of the individuation process is an archetype called "the Self." The Self represents movement toward wholeness and the balancing of the different sides of the psyche into a unique, integrated personality. This archetype, projected onto forests and wilderness, could give rise to the perception of nature as the embodiment of perfect balance, beauty, symmetry, and wholeness.

The Role of Projections in Experiencing Nature

Unconscious archetypes have powerful effects on how people experience and behave in the world (Jung 1960). For this reason it is important for the conscious mind to have methods for relating to the archetypes in a constructive way. This has traditionally been the function of mythological symbols and religious rituals, but these symbols and rituals have lost much of their force in our modern culture. For many people, nature now seems to call forth the archetypal experiences that traditional religious images no longer evoke.

When archetypes are projected onto natural environments, these environments evoke powerful emotions and take on a profound significance for the individual. For the nature-lover, trees and other natural entities can evoke awe-inspiring fascination and reverence. The forest or wilderness may seem like an paradise on earth, a magical place of eternal mystery and perfection, far removed from the mundane world of everyday life. Vest (1983) identifies the experience of solitude in nature with the "soul mood" sought by the ancient Celts in their sacred groves. Even modern, scientifically trained people are apt to experience this mood, as the following description of a giant sequoia grove from an otherwise very technical forestry textbook of the 1950's indicates:

> In their presence, all sense of proportion is lost, and smaller trees which may be 4 to 10 ft. in diameter appear dwarfed by comparison. It is small wonder, therefore, that a feeling of reverence comes over one upon entering a grove ... whose gigantic red trunks are like the supports of some vast outdoor cathedral. The emotions aroused by the silent ageless majesty of these great trees are akin to those of primitive man for whom they would have been objects of worship, and it is unlikely that many centuries of scientific training will ever completely efface this elemental feeling (Harlowe and Harrar 1958, p. 202).

Experiences of this kind are important to psychological health because they draw people toward connection and relationship

with the transcendent archetypes that underlie their individual personalities. This is the psychological meaning of the ancient myths in which the World Tree and the Sacred Grove were points of contact between the mundane and the sacred realms.

Withdrawing Projections

There are potential problems, however, as long as archetypal projections remain unconscious -- that is, as long as an individual does not realize that the experience comes from within the psyche, and instead believes that it is entirely due to something "out there." A person who is projecting an archetype tends to perceive the world in terms of ideals and absolutes, and this can blind the person to the objective nature of the "other" onto which the archetype is being projected. This can cause people to disregard objective information, to hold unrealistic expectations, and to behave in fanatical ways.

From the viewpoint of Jungian psychology, healthy relationships with people and things require one to become more conscious of the archetypal projections in one's perceptions and behavior (Jaffe 1990). One must learn to see the difference between the inner archetype and the outer object or person onto which it is being projected. Withdrawing projections in this way is not easy to do. It can be a painful process, involving feelings of loss and disillusionment. Ultimately, however, it leads to a more balanced and realistic appreciation of both the objective and the subjective aspects of the world.

A person who becomes aware of how archetypes are projected onto nature acquires a sort of "double vision." The experience of nature becomes like looking out of a house through a glass window pane. Through the window one can see objects that lie outside the house, but the glass also shows reflections of things that are inside. Similarly, through our experience of nature we can observe the workings of the outer world of physics and biology, but at the same time nature reflects back to us the images of our own inner, psychological world. This is perhaps most clearly illustrated in the night sky, where the stars and constellations carry the names and images of our mythological heritage while at the same time serving as an entry into a scientific understanding of the physical universe (Grossinger 1988, de Santillana and von Dechend 1969).

Inner-outer Parallels

Jungian psychologists have pointed out that there is a correspondence between the outer wilderness of nature and the inner "wilderness" of the unconscious mind (Meier 1985). The archetypes represent instinctive, intuitive psychological processes that are not under our conscious control. They can be viewed as the inner, subjective counterpart of the processes of outer nature (Jung 1933, ch. 5). In this view, the heavy-handed manipulation of natural environments by Western society parallels the conscious ego's repressive attitude toward the unconscious, non-rational, and intuitive parts of our own psyches. When we manipulate the outer environment without understanding and respecting its physical and ecological functions, these functions return to us in the negative form of pollution and global climate change. Similarly, when instinctive psychological functions are ignored or manipulated by our rational egos, these functions come back to us in the form of neurotic symptoms. The repression of natural functions in the psyche and their return in a negative form are depicted using nature symbolism in the following two examples from Greek mythology.

Pan, the pagan god of woods and fields, was a wild, irrational deity with the horns and hooves of a goat. He was believed to evoke sudden fear in solitary travelers in the wilds -- hence the word "panic." Despite his frightening qualities, he was viewed in a basically positive way by the ancient Greeks. He loved to play the pan-pipes, and the nymphs who inhabited trees, streams, and caves were his partners in dance. He eventually came to be regarded as the representative of paganism and the personification of all nature. The name "Pan" literally means "All" (Bulfinch 1959).

At the time of Christ's birth, a mysterious voice was supposed to have been heard in the Greek Isles announcing that great Pan was dead (Bulfinch 1959, de Santillana and von Dechend 1969). The death of Pan could be interpreted psychologically as the repression of the instinctive, wild parts of the psyche, which occurred with the rise of monotheistic consciousness in Western society. Great Pan did not really die, however. His horned and hoofed image was incorporated into the Christian mythology of Satan. Thus when the natural archetype of Pan was repressed, it reappeared in a negative form as the great Enemy, a source of danger, suffering, and evil (Nichols 1980).

In Jungian terms, we could say that the archetype of the nature deity Pan was cast into the darkness of the collective "Shadow," which is the archetype containing all the impulses and attitudes judged unacceptable by society. The inner psychic struggle between consciousness and instinct was then projected onto the outer world of nature. Ever since, Western civilization has been acting out an archetypal battle between Light and Darkness with wild nature in the role of Darkness, which must be conquered, civilized, and subdued.

Another account of conflict is found in the myth of the wood-cutter Erisichthon, who angered the goddess Demeter by cutting a grove of sacred trees. Heedless of Demeter's pleas, Erisichthon cut an ancient oak at the very center of the sacred grove, thereby killing the Dryad (wood-nymph) who inhabited the tree. In retribution Demeter called upon the goddess of famine to afflict Erisichthon with insatiable hunger. Driven by the craving for food, he spent all his wealth and repeatedly sold his own daughter as a slave in order to feed his hunger. But the great quantities of food that he ate gave him no satisfaction. Ultimately, he died when he tried to devour his own body (Graves 1960, Bulfinch 1959, Hamilton 1942). This myth can be interpreted as a symbolic depiction of our culture's devaluation and repression of the intuitive, spiritual aspect of nature and of the psyche, and the consequences this has produced.

Erisichthon's fault was not that he made a living by cutting trees. There would have been no problem if he had been content to cut only trees that stood outside the sacred grove. Erisichthon suffered because he refused to limit his cutting and because he would not respect the spiritual dimension represented by the Dryad in the oak tree. When Demeter herself, the goddess of vegetation, fertility, and harvest, appeared to plead with him in the sacred grove, he still stubbornly refused to deviate from his course. As a result, the archetype of the benign goddess returned to him in the negative form of hunger and famine. Like the reemergence of Pan in the image of Satan, this represents the psychological fact that a repressed archetype does not disappear, but assumes a negative form that can overwhelm the conscious ego. This interpretation of the myth suggests that our culture's devaluation of the spiritual dimension that the psyche experiences in nature has lead to an insatiable hunger for goods and resources that is undercutting the physical basis of our survival.

The story of Erisichthon seems to foreshadow the multiplicity of compulsive and addictive behaviors that now plague our society. Jungians have suggested that modern people are experiencing a spiritual famine, and that addictive behavior is a futile attempt to fill the spiritual emptiness with an inadequate physical substitute (Jaffe 1990, Johnson 1987). In our culture, which has emphasized objective knowledge of the outer, physical world while neglecting the inner, spiritual side of life, one of the greatest values of nature may be the opportunity it offers us to become reconnected with our own unconscious nature and to fill the spiritual vacuum within (Williams 1990).

Conversely, it can be argued that the crises we have created in the outer world of nature can only be resolved by healing the divisions and conflicts within our own psyches. Reconciliation with both outer and inner nature seems essential if our civilization is to survive.

Implications for Research

The ideas described above are an outgrowth of the work of Carl Jung. As environmental issues become more prominent, the relationship between nature and the unconscious psyche is increasingly being discussed among Jungian psychologists. The book *A Testament to the Wilderness*, edited by Hinshaw (1985), is an excellent example. If we take these ideas seriously, there is clearly an urgent need to recognize and to learn more about the spiritual aspects of nature and psyche.

In approaching the spiritual aspect of nature, it is important to recognize that the human psyche can function and communicate in two quite different modes. Our technological culture places great emphasis on the rational and analytical mode of thought, which seeks to understand and explain everything in terms that are as explicit, precise, and unambiguous as possible. In this mode, mathematics and logic are the tools of choice for understanding how things work and for ordering our affairs.

Spiritual phenomena, on the other hand, emanate from the intuitive side of the psyche, which manifests itself in an ambiguous language of nonverbal imagery and symbolism. This mode of psychological functioning lends itself more naturally to the indirect, many-layered expressions of art, poetry, and music than to the rigorous, literal language of science. It may be difficult for scientifically trained researchers and managers to deal with the spiritual aspect of nature because their training teaches them to devalue and reject the intuitive and emotional mode of functioning in which spiritual phenomena appear (Vining and Schroeder 1987).

To do justice to spiritual phenomena in natural resource research and management, it will be necessary to develop a more balanced relationship between the rational and the intuitive sides of the psyche, with neither function dominating the other. Towards this goal, I think it may be helpful to reconsider and broaden some of the underlying assumptions and attitudes of our scientific approach. Following are a few of my tentative thoughts about how to do this, inspired by ideas from phenomenological, experiential, Jungian, and archetypal psychology.

Spiritual phenomena might best be approached by adopting a phenomenological as opposed to a physical definition of reality. That is, the starting point for investigation would be the "life-world" as it is immediately experienced by people (Keen 1975). Psychological phenomena would be regarded as real in their own right and would be studied on their own terms, rather than being reduced to mechanistic concepts taken from the physical or biological sciences (Giorgi 1970).

Spiritual phenomena in nature are revealed in qualitative accounts of individuals' subjective experiences, rather than in quantitative measurements and statistical models of behavior. Material for study could be drawn from many sources, including surveys and interviews, written materials published by various groups and organizations, art, literature, and mythology. An important source of material would be the researcher's own personal experiences, intuitions, dreams, and feelings regarding nature. The researcher would not be a detached, passive observer, but would be actively involved in discovering the spiritual significance of nature in the context of his or her own life.

In the course of this exploration, the researcher would be engaged in an interplay between the rational and the intuitive functions of the psyche. At times it might be necessary to suspend the rational and analytical mode of thinking, to allow the intuitive process to function without interference. At other times the researcher would need to step back from the flow of intuition to clarify, organize, and evaluate the view that is emerging. The process would not proceed in a straight line. The intuitive process cannot be hurried, forced, or manipulated according to conscious plans. The researcher would need patience and a willingness to follow the process through many unexpected turns.

Methods for approaching this study could be drawn from several areas of psychology. Jungian psychologists have evolved methods for bringing people into contact with the unconscious mind in psychotherapy and for interpreting the symbolic expressions that this process produces (Johnson 1986, Hillman 1975). Elements of the Jungian approach could be valuable for increasing our awareness and openness to the spiritual aspect of nature. Techniques developed by experiential psychologists could also be used to unfold the unconscious meanings hidden in the vague felt senses we experience in natural environments (Gendlin 1981, Schroeder 1990). Methods developed by phenomenological psychologists (e.g. Giorgi 1985) could be helpful for analyzing the meaning structures contained in descriptive accounts of people's experiences in nature.

The findings of research on the spiritual aspect of nature may not lend themselves well to the traditional, "dry" research report. Methods for conveying the researcher's findings may require more personal, evocative, and metaphorical expressions (Maslow 1974, Porteous 1984). Artistic, musical, and poetic works could be an important means for communicating new understandings about the human-nature relationship (Crowfoot 1990).

This approach to the spirituality of nature will not produce any definitive, predictive models, nor will it yield any final, "true" answers regarding the management of natural resources. Its purpose is not to give humans any greater degree of control over outer or inner nature. Its underlying motive is to deepen our awareness of the intuitive relationship between humans and nature, and to allow ourselves to be changed by that awareness. In this way, by balancing and reconciling the rational scientific and the intuitive spiritual processes of the psyche in ourselves and in our society, we may be able to move toward a more viable relationship between humans and the natural world.

Implications for Management

Natural resource managers often seem to believe that opposition to resource management policies is due mainly to ignorance on the part of the public. Many managers view the public as victims of misinformation, and assume that if correct information about resource management could be effectively

communicated, then public protest would greatly diminish. The viewpoint outlined in this paper suggests, however, that the problem goes deeper than a simple question of factual knowledge. Beneath the surface of natural resource conflicts (such as the spotted owl and old growth controversies), there may be powerful unconscious archetypes, which do not respond to logical argument or rational persuasion.

People who have experienced a spiritual connection in nature may find *any* effort toward management and control of natural environments to be disturbing, no matter how scientifically well-founded such efforts are. From a spiritual viewpoint, nature represents an "other" to be loved and respected, rather than a physical and biological process to be controlled and manipulated for human benefit. The projection of unconscious archetypes onto a natural setting results in a deep emotional bond that can make any human intervention in the setting appear morally wrong, especially if it is carried out in a coldly rational way.

Managers who are trained in the physical and biological sciences may be inclined to ignore or discount the spiritual values of people who oppose their management efforts, because such values seem inconsistent with a scientific understanding of the resources. There is a tendency to regard spiritual value as a recreational "amenity" -- a somewhat frivolous side issue next to the "real" concerns of hard science and economics. Arguing that spiritual values do not have a basis in traditional science does not, however, in any way diminish their power to motivate people. To many people, ancient forests and wilderness are genuinely sacred places, even though they are not associated with any officially recognized religion. A threat to the existence of wild nature is a threat to the central spiritual value of many people's lives. Recognizing this, it should not be surprising that people's reactions to such threats can be vehement and violent.

To move toward a better understanding of these conflicts, natural resource professionals need to become more aware and respectful of the psychological and spiritual aspects of natural environments. We need to recognize that humans and nature are not separate, and that spiritual phenomena are therefore an inherent aspect of the natural world. Spiritual phenomena are just as much a part of the real world as are ecological processes like competition and predation. By now most people realize that management efforts that ignore ecological interrelations among species can produce unexpected and disastrous consequences. We need to recognize that ignoring the psychological and spiritual connections between humans and the natural world can result in equally nasty surprises.

At the same time, people who feel a spiritual connection with nature need to recognize that nature also has physical, biological, and economic dimensions that cannot be ignored. I believe it is essential for our civilization to regain a genuine sense of the sacred in nature, but in so doing we must not lose sight of the scientific understandings we have gained. People who experience spirituality in nature should strive for clearer awareness and communication of their own spiritual feelings, but they should resist the temptation to disparage those who hold a different view of nature. No single viewpoint can encompass all the dimensions of nature, but if we respect, listen to, and learn from each other, perhaps we can find a new management perspective that integrates both the science and the spirituality of natural environments.

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THE EXTENT & TYPES OF RECREATIONAL OPPORTUNITIES WITHIN THE STATE OF MAINE FOR PEOPLE WITH DISABILITIES

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The purpose of this study was to determine the extent and types of recreational opportunities within the state of Maine that were available to people with disabilities. The major findings were that people with disabilities participated in recreational opportunities on a limited basis, that the majority of activities offered were stereotypical of people with disabilities and that the majority of activities were integrated into regular recreation programs.

Recreation is a basic right which should be afforded to all people (Austin, 1987), yet various groups in society including people with disabilities often are excluded because of environmental barriers such as architecture, transportation, economics, and public attitudes. In the past, recreation opportunities have consisted of segregated programs sponsored through advocate associations such as the National Association for Retarded Citizens or the National Wheelchair Association. Through litigation such as the Pennsylvania Association for Retarded Citizens (PARC) vs. Pennsylvania court case and legislation such as Section 504 of PL 93-112 (The Rehabilitation Act) and PL 94-142 (The Education for All Handicapped Children Act) individuals have gained the right to live and be educated in the least restrictive environment. This has facilitated the movement of large numbers of people into community living situations and has shifted the responsibility for recreation from advocate associations to community agencies and to the private sector.

The purpose of this study was to determine the extent and types of recreation programs available to adults and children with disabilities within the state of Maine. The study was designed to compile data from federal, state, municipal, private non-profit and camp sources and to compare information concerning the following:

1. The availability of recreational opportunities for people with disabilities.
2. The types of recreational opportunities available.
3. The types of disabilities of people who participated.
4. The numbers of people with disabilities that were being served.
5. The administrative aspects of recreational programs for people with disabilities such as funding, staffing and timing of programs.
6. The current level of integration within recreation programs.
7. The reasons for the lack of opportunities within recreational programs.
8. The assistance needed by programs to provide recreational opportunities for people with disabilities.

Procedures

Because the study looked at programs on the federal, state, municipal, private non-profit and organized camp levels, the population was compiled from many sources. Information concerning federal organizations was obtained from the National Park Service, the National Forest Service, the U.S. Fish and Wildlife Service, and military installations within the state. The Bureau of Inland Fisheries and Wildlife and the Maine Bureau of Parks and Recreation provided information concerning state programs. Information on local government sponsored programs was obtained from municipal park and recreation departments. Organizations including Boys Clubs, YMCAs, YWCAs, Boy and Girl Scouts, Special Olympics, Hurricane Island Outward Bound School, the Recreation Center for the Handicapped, Inc., Maine Special Olympics, Freedom Riders, and Maine Handicapped Skiing provided information on programming in the non-profit area. Information on organized camps was obtained from the 1989 Maine Directory of Children's Camps published by the Maine Youth Camping Association.

A survey was designed and tested specifically for this study and contained structured questions of the multiple choice type with the respondent choosing one or more fixed alternatives. Several researchers (Crocker, 1989; Schleien & Werder, 1985) have developed survey instruments to compile data concerning community recreation for people with disabilities and copies of these surveys were obtained for examination.

An introductory letter was sent to 230 participants which introduced the researcher and explained the purpose and the procedures of the research. The instrument was pilot tested, revised, and then sent to 202 participants along with a letter and a postage-paid return envelope. The number of surveys sent out was reduced from the original number of 230 because of duplication of names, incorrect addresses, and the desire not to participate by several people. As a result of the initial mailing and follow-up procedures, 122 of the 202 surveys (60.4%) were returned. Table 1 represents the return rates for the five groupings of programs surveyed.

Table 1. Survey Return Rates (N =122)

Grouping	Sent	Received	Percentage
Federal	7	7	100.0
State	7	3	42.8
Municipal	70	45	64.2
Private Non-Profit	38	24	63.1
Camps	80	43	53.8

Findings

1. The following percentages of agencies or businesses reported having people with disabilities participate in recreational opportunities: federal grouping = 71.4%; state grouping = 100%; municipal grouping = 77.7%; private non-profit grouping = 95.8%; camps grouping = 44.2%.

2. The program areas offered most frequently on an integrated basis by agencies and businesses were arts and crafts (68.2%), swimming (65.8%), team sports (60.9%), camping (68.1%) and special events (54.9%).

3. The program areas that were offered most frequently on a segregated basis by agencies and businesses were arts and crafts (6.5%), dance (6.5%), swimming (15.6%), team sports (9.1%), camping (5.2%), horseback riding (5.2%) and special events (7.8%).

4. The following groups of people with physical disabilities participated most frequently in recreational opportunities in 1989: federal grouping - no data available; state grouping - no data available; municipal grouping - health impairments (median = 5.0), speech and language impairments (median = 3.5) and hearing impairments (median = 3.0); private non-profit grouping - health impairments (median = 25.0), orthopedic impairments (median = 18.0) and speech and language impairments (median = 12.0); camp grouping - speech and language impairments (median = 30.0), health impairments (median = 3.0) and hearing impairments (median = 6.0).

5. The following groups of people with cognitive disabilities participated most frequently in recreational opportunities in 1989: federal grouping - no data available; state grouping - no data available; municipal grouping - learning disability (median = 5.5), mental retardation (median = 5.0), private non-profit grouping - learning disabilities (median = 16.5), mental retardation (median = 16.0); camp grouping - learning disabilities (median = 4.5), mental retardation (median = 40.0).

6. People with psychological disabilities participated in recreational opportunities in the following frequencies in 1989: federal grouping - no data; state grouping - no data; municipal grouping - median = 2.0; private non-profit grouping - median = 2.5; camp grouping - median = 30.0.

7. The following percentages of people with physical disabilities participated in recreational opportunities: federal grouping - no data; state grouping - no data; municipal grouping - median = .46; private non-profit grouping - median = 1.74; camp grouping - median = 1.49.

8. The following percentages of people with cognitive disabilities participated in recreational opportunities: federal grouping - no data; state grouping - no data; municipal grouping - median = .32; private non-profit grouping - median = .74; camp grouping - median = 2.13.

9. The following percentages of people with psychological disabilities participated in recreational opportunities: federal grouping - no data; state grouping - no data; municipal grouping - median = .11; private non-profit grouping - median = .34; camp grouping - median = .43.

10. The sources of funding for recreational programming varied widely depending on the nature of the agency or business (public or private), yet a certain percentage of the total funding within each grouping came from fees.

11. Programming was provided on a year round basis by 60% of the federal grouping, 66.6% of the state grouping, 71.4% of the municipal grouping and 43.4% of the private non-profit grouping. The majority of the programming in the camp grouping (89.4%) was done during the summer.

12. The largest percentage (57.6%) of respondents indicated that general staff were responsible for providing direct service to people with disabilities.

13. The percentage of segregated activities (12.5%) was considerably less than the percentage of integrated activities (87.5%).

14. Of the agencies and businesses (18.3%) that did not offer recreational opportunities to people with disabilities, 51.4% indicated that one reason for not providing programs was lack of funds and 48.6% indicated inaccessible facilities and leaders who were not trained to work with people with disabilities.

15. Within the group of agencies and businesses that did not provide programs, 81.1% indicated that technical assistance was needed and 78.4% indicated that staff training and professional programming consultation was necessary for them to be able to provide programming.

16. Within the group of agencies and businesses (81.7%) that did provide programs, 63.5% indicated that staff training was needed and 56.5% indicated that financial assistance was necessary for them to be able to expand their offerings.

Discussion

Availability of Recreational Opportunities

The first intent of this study was to determine the availability of recreational opportunities for people with disabilities. Respondents were asked to indicate whether or not people with disabilities participated in their recreation programs. The high percentage of response from the federal (71.4%), state (100%) and municipal (77.7%) groupings indicates that people with disabilities participated in these programs. As a result of federal legislation such as the Rehabilitation Act (PL 93-112), organizations that receive money from the federal government may not discriminate against an individual with disabilities solely on the basis of that disability. It appears from the data that the federal, state and local groupings are cognizant of PL 93-112 and their responsibility to provide recreation programs for all people in the community.

The private non-profit grouping also had a large response to the question (95.8%). This grouping included organizations such as the Girl Scouts, Boy Scouts, YMCAs, YWCAs, and Boys and Girls Clubs whose programs are aimed at the development of the "whole child," and are open to all members of the community (Erickson, 1983). The data suggest that this grouping as a whole provided recreation programs that are open to the community and that include people with disabilities.
The low response from the camp grouping (44.2%) indicates that not many people with disabilities participated in summer camp experiences in Maine. Since there are several summer camps which offer programs specifically to people with disabilities, it appears that these camps were not members of the Maine Youth Camping Association and were not included in the directory of summer camps published by the Association which was used for this study. Consequently these camps were not surveyed. Based on the data from this study, the camp grouping as a whole has a low participation rate from people with disabilities.

Activities Offered

The second intent of this study was to identify what types of recreational opportunities were available to people with disabilities. Results of the survey indicate that the activities offered most frequently to people with disabilities in Maine included arts and crafts, dance, team sports, swimming, physical fitness activities, horseback riding, camping and special events. The majority of these activities are stereotypical of

people with disabilities. Activities such as arts and crafts, swimming, sports and games and special events have historically been offered to people with disabilities because of their therapeutic value (Kraus, 1983).

Within this study it was found that most of the activities offered were similar to the ones historically offered, yet there were some differences. For example, camping was offered as an activity for both people without disabilities and people with disabilties in every grouping except for the municipal grouping. Dance and horseback riding were offered as segregated programs (available only to people with disabilities) in both the municipal and private non-profit groupings. The variety of activities that many agencies or businesses offered broke away from the stereotypical activities for people with disabilities with examples such as auto mechanics, puppeteering, photography, gymnastics, judo, tennis, downhill and cross country skiing, canoeing, and wilderness adventure activities. Although the majority of activities offered by agencies and businesses were stereotypical, there was evidence of a trend towards a wider spectrum of activities being offered to people with disabilities.

People Who Took Part in Programming

The third intent of this study was to determine the types of disabilities of people who took part in recreation programming. The data from this study seem to indicate that within the state of Maine, people with a wide variety of disabilities were served. People with physical disabilities who participated most frequently were those people with speech and language impairments, health impairments, orthopedic impairments and hearing impairments. People with cognitive disabilities who participated most frequently were those people with mental retardation. People with psychological disabilities participated in recreation programs, but it was difficult to obtain an accurate picture because of the hidden nature of the disability.

Numbers of People Who Participated in Programming

The fourth intent of this study was to determine how many people took part in recreational opportunities. The incidence of people with physical disabilities in the general population is as follows: hearing impairments - 1%; visual impairments - .04%; speech and language impairments - 3%; and cerebral palsy - .15% (Batshaw & Perret, 1986). Due to the lack of uniformity in defining orthopedic impairments and health impairments, statistics of incidence are neither meaningful nor accurate (Dunn & Fait, 1989). The percentage of people with physical disabilities participating in programs on the municipal (.46), private non-profit (1.74) and camp (1.49) levels was below the majority of the national incidence rates. These data suggest that people with physical disabilities are being underserved in all three groupings. Specific numbers of people participating in programs was not kept by any of the respondents in the federal and state groupings.

The incidence of people in the general population with mental retardation is 3%, people with learning disabilities is 4-5% (Dunn & Fait, 1989) and people with autism is .04% (Batshaw & Perret, 1986). The percentage of people with cognitive disabilities participating in both the municipal (.32) and private non-profit (.74) groupings in Maine was well below the national incidence rate. The percentage of people with cognitive disabilities in the camps grouping (2.13) was above the incidence rate, however, the majority of the people with cognitive disabilities within the camps grouping had learning disabilities. These findings indicate that people with cognitive disabilities were underserved in terms of recreational opportunities.

The incidence of psychological disabilities is difficult to pinpoint because a growing tolerance for greater variations in acceptable behavior makes it more difficult to label certain patterns of behavior as being unacceptable or abnormal (Carter, Van Andel & Robb, 1985). In the early 1970's psychological disabilities were said to affect one out of every ten persons in the United States (Kraus, 1983). The percentage of people with psychological disabilities participating in each of the municipal (.11), private non-profit (.34) and camp (.43) groupings was below 1% which is well below the general national incidence rate of 10%. One respondent noted that the numbers of people with psychological disabilities was unknown because unless a problem was specifically addressed to administrators or to leaders, the disability would not be recognized. The hidden nature of psychological disabilities make them more difficult to recognize. It is not possible to conclude based on data from this study whether or not the population of people with psychological disabilities is being served adequately.

Extent of Integration

The fifth intent of this study was to determine the extent of integration. The data indicate that the majority of recreation programs in Maine that served people with disabilities were integrated. The percentage of segregated activities (12.5%) was considerably less than the percentage of integrated activities (87.5%). The private non-profit grouping was the largest area in which segregated programs existed, yet within these programs there was evidence that the philosophies of integration and normalization are changing recreation programming. There are also several camps within the state which offer segregated programs. Since the majority of camps within the state offer limited access to people with disabilities other than learning disabilities, these segregated camps remain a viable option for people with disabilities. Summer camps offer opportunities for personal growth and human interaction and when these experiences take place in an integrated setting both people with and without disabilities benefit from the experience.

Administrative Aspects of Programs

Funding. The sixth intent of this study was to determine administrative aspects of recreation programs for people with disabilities such as funding sources, timing of programs and leadership of programs. Respondents were asked to indicate the percentage of funding for their organization which came from public tax funds, fees, grants, voluntary contributions, United Way or other sources. The results indicated that funding sources varied depending on the private or public nature of the agency or business, but that within every grouping fees constituted a certain part of the funding.

The implication of this finding is that for people with disabilities to be able to participate in recreational opportunities, they need to contribute monetarily. A Harris Poll conducted in 1985 indicated that two thirds of the population of people with physical disabilities in the United States between the ages of 16-64 were unemployed (Harris, 1986). When people with disabilities are able to find employment, the positions are frequently low-paying with limited opportunity for advancement. Compounded with this are the higher than average expenses incurred by some people with disabilities to purchase specialized equipment such as vans with wheelchair lifts and/or custom-made clothing. The end

result is less discretionary money available to spend on leisure pursuits.

The principle of normalization promotes optimal independent functioning and encourages integration into the mainstream of society. Part of that responsibility is paying for the things for which other people in the community pay. Free or reduced prices for people with disabilities is discouraged by the principle of normalization. Since many people with disabilities lack the income to be able to participate in recreation opportunities that cost money, the result is less participation in leisure by people who have disabilities (Kennedy, Austin & Smith, 1987). The fact that a certain percentage of the funding in all five groupings from the state of Maine comes from fees could be an important factor as to why more people with disabilities do not participate in recreational opportunities. The economic barrier which is caused by the application of a fee schedule may be a hindrance for participation by people with disabilities.

Timing of Programs. Respondents were asked to indicate if programming took place year-round, during the summer, or at other specific times during the year. Results indicated that the majority of programming for people with disabilities occurred either on a year-round basis or on a summer only basis. In the federal, state, municipal and private non-profit groupings over 50% of the respondents indicated that all of their programs ran year round. In the camp grouping, the majority indicated that programming ran during the summer months only. Since most camps are for children and young adults, it would be expected for them to run during the summer months. The data suggest that programs occurred on a entifnual basis, not just at certain times during the year. People with disabilities, like the rest of the population, have leisure needs during the entire year. The data from this study indicate that recreational opportunities are available to them throughout the year.

Staffing. It was found that general staff were responsible for providing direct service to people with disabilities the majority of the time. A small percentage (8.2%) of agencies in the municipal and private non-profit groupings indicated that therapeutic recreation specialists were responsible for programming. In order to integrate people with disabilities into recreational programs in the community, general staff need to be responsible for programming and teaching activities. Most agencies or businesses cannot afford to hire a therapeutic recreation specialist to ensure that people with disabilities are being served, and research shows that most people with disabilities living in the community do not want to receive therapeutic recreation in community settings, but simply desire to have the opportunity to take part in recreation experiences (Kennedy, Austin & Smith, 1987). It is the general staff of recreation agencies and businesses who need to be trained in techniques concerning integrating people with disabilities into regular recreation programs in order for recreation integration to be successful. The therapeutic recreation specialists role needs to change from one of organizing and leading recreation activities for people with disabilities to one of consulting and working with recreation organizations on the techniques to integrate programs.

Reasons for Lack of Programming

The seventh intent of the study was to determine the reasons that agencies or businesses lacked programming for people with disabilities. Three major responses were evident: lack of funds, inaccessible facilities and leaders who were not trained to work with people with disabilities. The three major responses dealt with money, as funding is necessary for making facilities more accessible and for training staff. The implication of lack of funds is that if agencies and businesses are committed to the philosophies of normalization and integration, they will need to find methods to overcome the financial problems in order to provide programs for people with disabilities.

Assistance Needed

The final purpose of this study was to determine the assistance needed by agencies or businesses in order for them to be able to provide quality programming for people with disabilities. The largest percentage of respondents who did not provide programming (81.1%) indicated that technical assistance which was defined as accessible facilities and adapted equipment was necessary in order for them to develop recreational opportunities. The next largest percentage of respondents (78.4%) indicated staff training and professional programming consultation as being necessary for them to be able to provide programming. The largest percentage (63.5%) of programs among those that currently offer activities responded that staff training was necessary for them to be able to expand programming. The implication of these data is that in order for more agencies and businesses to develop additional recreational opportunities, facilities must be equipped to handle people with disabilities and staff must be trained to lead programs.

Conclusions

The purpose of this study was to determine the types and extent of recreational opportunities available to people with disabilities in the state of Maine. Data from this study indicate that there is much that recreation organizations can and should be doing to promote integrated recreation opportunities for people with disabilities.

1. The directors of recreation agencies and businesses need to become educated in the concepts of normalization and the methods of integrating their recreation programs. This could be done through professional organizations with (1) workshops at state and national conferences, (2) specific training sessions given to groups of professionals working in similar settings and (3) articles in professional journals at the state and national level.

2. The concept of including people with disabilities in recreational programming needs to be part of all aspects of recreation agencies and businesses (e.g.) policies and procedures, marketing, staff hiring and training, and program evaluation. Policy manuals should reflect the commitment of agencies and businesses to provide recreational opportunities to people with disabilities. Job descriptions should convey the expectation that staff works with a variety of people, including individuals with disabilities. Marketing materials such as advertisements, brochures, public service announcements, etc. should include statements concerning the availability of integrated opportunities for individuals with disabilities.

3. When hiring staff, administrators should seek out persons with experience working with individuals with disabilities and should also consider hiring persons with disabilities as instructors. Comprehensive on-going staff training programs need to be developed to train staff in (1) characteristics of specific disabilities, (2) methods for adapting teaching techniques, activities and equipment, and (3) methods for integrating people with disabilities into regular recreation programs. Program evaluation should be done continually which would indicate if program goals and objectives were being met, if programs were meeting

participant needs, and what changes could be made in programs.

4. Agencies and businesses need to be creative in order to overcome funding problems in developing programs for people with disabilities. Funding could be obtained from grants and donations, and many of the costs involved in running programs could be reduced by (1) developing programs that would not need specialized equipment, (2) sharing resources with other agencies and businesses, and (3) networking with organizations that have expertise in working with people with disabilities. Methods for reducing fees should also be developed by agencies and businesses. Such methods might include (1) a sliding fee schedule for all participants based on their ability to afford the cost of the activity, (2) a policy by which attendants needed by a person with a disability would be allowed to attend free of cost, (3) exchange of volunteer work for program fees, and (4) the development of a scholarship fund.

5. People with disabilities who are living in the community need to become educated concerning the concepts of leisure and recreation and the methods of accessing those resources that are available to them in the community. This could be done through (1) the public school system, (2) agencies serving people with disabilities and (3) advocate agencies. An Individualized Education Plan (IEP) must be developed for every child receiving special education in the public school system. An Individualized Service, Treatment or Program Plan (ISP, ITP, IPP) must be developed for adults with disabilities in clinical/rehabilitation and hospital settings, residential centers, group homes, and day centers (MacMillan, 1982; Howe-Murphy & Charboneau, 1987). The development of specific recreation skills could be incorporated into these plans along with the goal of learning about and becoming involved in community recreation programs. Throughout this process the individual could develop the skills and knowledge necessary to be able to participate in integrated community programs. Advocate agencies could act as resources for people with disabilities by disseminating information concerning recreation opportunities available in local communities.

Based on the results of the present survey and the many positive comments from recreation administrators which were included with the returned surveys, this researcher feels that there is a favorable atmosphere for developing more integrated recreational opportunities for people with disabilities. Through education of people with disabilities concerning their leisure needs and the resources available in the community, education of administrators concerning the importance of and methods of accomplishing integration, and education of staff concerning teaching integrated recreation activities, it will be possible to develop integrated recreation programs within many communities. The result will be that people with disabilities will have the same opportunity for recreation and leisure experiences as other members of the community.

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IMPLICATIONS OF BOY SCOUT GROUP USE OF PUBLIC LANDS FOR NATURAL RESOURCE MANAGERS: A REGIONAL COMPARISON

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Resource managers can apply group-specific rather than generic communications and management strategies to different public land user groups. This study compares use patterns of one user group, Boy Scout troops, from two regions of the United States. It identifies their public land use patterns, activities, needs, and motivations. Results can be used by resource managers to develop communications and management strategies to guide this group's appropriate behavior, enhance their experience, and solicit their help in protecting the resource.

Introduction

Resource managers of both natural and cultural sites use interpretation and other communications strategies for a variety of purposes: to enhance visitors' experiences, to achieve specific management goals, and to promote their agencies' images (Sharpe 1982). Managers often apply the same communications messages and strategies to all their visitors. Additionally, managers often apply a single technique to guide appropriate visitor behavior (such as using law enforcement to reduce vandalism) for all visitors. However, just as it is minimally effective to promote a program, site or product to a "typical" or "average" client or user, it is unlikely that carbon copy management or communications strategies used with different users will be equally effective in providing appropriate facilities, sites, programs and information; identifying sources of potential user conflicts; or protecting the sites.

Differences in user behavior can be particularly divergent when norms for appropriate behavior at resource sites are not known by the visitors. Appropriate opportunities and facilities cannot be provided unless the visitors' needs are known. Therefore, resource managers must attempt to identify these needs, then target their communications and management strategies for specific user groups just as business persons target market their products and programs (More 1983). Numerous studies have shown that such strategies can be effective. (See references listed in Vander Stoep, 1990 NERR Proceedings.)

At last year's NERR Symposium, I presented a paper describing the use patterns, activities, resource needs, and behavior motivators of Boy Scout groups in the southcentral region of the United States. Since that time, the survey of Boy Scout troops in the northeast region of the United States was completed. This paper presents the results of that study as well as compares them with results from the southcentral region.

Statement of the Problem

The purpose of this study is to identify land use patterns, activities engaged in, information and other resource and service needs, effective methods for motivating and controlling behavior, and characteristics of Boy Scout groups who use public lands in both the northeast and southcentral regions of the United States. Results are used to identify implications of Scout group use of public lands, to help resource managers understand Scouts and their program, and to develop strategies for effective management of and information dissemination to Scout groups which use public lands.

Methods

Based on Dillman's (1978) "total design method" (TDM), surveys were sent to Scoutmasters in the southcentral United States (Arkansas, Alabama, Kentucky, Mississippi, Missouri and Tennessee) and the northeastern United States (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont). In the southcentral region, surveys were sent to five troops in each of 30 councils (total sample size of 150); in the northeast region, surveys were sent to a stratified random sample of 258 troops based on community size in each of the Boy Scouts of America (BSA) councils. The southcentral region sample was drawn with the assistance of staff from the national BSA headquarters in Irving, Texas while the northeast region sample was generated by staff in the northeast regional BSA office located in Dayton, New Jersey.

The national BSA staff actually mailed the surveys and reminder postcards for the southcentral region, limiting control by the researcher. For the northeast region, mailing labels for the stratified random sample were sent to the researcher, thereby permitting more control of the timing and consistency of survey administration. Also, second followup letters, containing assurances that the survey was authorized by BSA, and a duplicate survey were sent to non-respondents in addition to the initial reminder postcards. This improved the response rate for the northeast region.

Before final printing and distribution of the original survey to the southcentral region in 1985, the survey instrument was reviewed by several recreation and parks researchers and Boy Scout leaders, then revised. The survey contained both closed- and open-ended questions used to identify the troops' public land use patterns, activities, information and service needs, motivations, and Scoutmasters' strategies for guiding youth behavior during their visits to public lands. Some group demographic information was collected.

Only two revisions were made to the second survey, both based on differences in public lands available in the two regions. For the northeast region survey, *Tennessee Valley Authority (TVA) projects* was deleted and replaced by *Military Facilities*; *State Lands*, which included a regional clarification, replaced *State Parks*. An additional question asked which level of development (ranging from highly developed to primitive) was preferred by the troop.

Open-ended questions for the southcentral survey were content analyzed independently by two social scientists (Labaw 1982). Each response was written on an individual index card. Each judge grouped and labelled several response categories based on general concepts included in the answers. Where differences existed, a final decision was made based on primary intent of the question. The same categories were used during analysis of the northeast region survey. Frequency tabulation of concept-coded responses was used to analyze data.

Results[1]

A total of 65 questionnaires of the 150 mailed in the south-central region were returned, resulting in a response rate of 43.3%. Two questionnaires were unusable. One was not completed because the troop did not use public lands, the other because the Scoutmaster was new and, therefore, unfamiliar with troop activities and use of public lands. A total of 173 north-east region surveys were returned, resulting in a response rate of 67%. Of these, three were undeliverable and seven were not usable for a variety of reasons, primarily because the troops were urban or served disabled populations which do not use public lands.

Troop Characteristics

Almost half of the southcentral troops (48% of those responding to this question) using public lands were relatively large, having more than 20 members, with 18% having 30 or more members. Only 35% had 15 or fewer members. Troops in the northeast tended to be smaller, with 52% having fewer than 15 members and only 21% having more than 20 members. Less than 9% had 30 or more members.

Eighty-five percent of the troops responding to the community size question were from communities having fewer than 50,000 residents, while approximately 19% of these were from quite small communities of less than 5,000. Only about 8% percent of the troops were from communities of more than 500,000 residents. Surprisingly, 70% of northeast troops were from communities smaller than 50,000 and only 6% from towns with populations larger than 500,000. Perhaps this is because residents in the northeast tend to identify more with their own towns than with a larger metropolitan area.

Many troop leaders in the southcentral region appear to be highly dedicated and committed to the BSA program as 48% of those responding had more than ten years of experience as Scoutmasters. Only 24% had three or fewer years of experience. Northeast troop leaders tend to have less experience, with 28% having three or fewer years experience and 31% having more than 10 years of Scoutmaster experience.

BSA Public Land Use Patterns

Types of lands used by Scout troops are varied in both regions. Southcentral troops use, in order of use frequency, state parks, national parks, water-based areas, (Army Corp of Engineers projects, TVA projects, and other waterways combined), national forests, local parks, state forests, and miscellaneous other federal and Canadian lands. Northeast troops also heavily use state parks, but other use differs. In order of use frequency, these troops use state forests, local parks and military areas extensively, followed by national parks and national forests. Water-based resources, used by 21% of troops, are used much less frequently than by southcentral troops. (See Figure 1.)

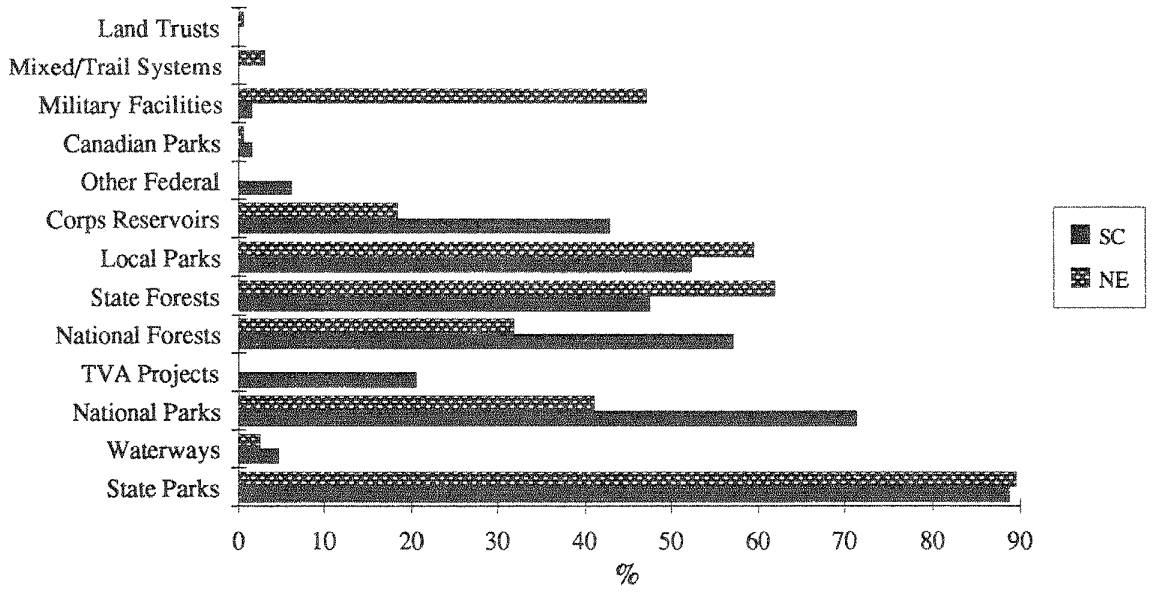

Figure 1. Types of public lands used by Boy Scout troops.

Patterns for day trips and overnight trips to public lands appear to be similar in both regions. Of the troops that take day trips, about 50% in each region take one to three per year while approximately 5% take 10 or more day trips per year. About 40% of the troops in each region take one to three overnight trips per year while about 41% take four to nine overnight trips. Some troops appear to be quite active, with 12% of southcentral troops and 18% of northeast troops taking 10 or more overnight trips each year. The combined day/overnight trip pattern seems to indicate that troops tend to take about one day trip and/or one overnight trip each month, with the possible exception of December or August (possibly due to holidays or family vacations).

A variety of adults accompany Scout troops on their trips to public lands. BSA-trained adult leaders accompany 90.5% of southcentral and 81% of northeast troops. Both untrained volunteer parents (for 52% of southcentral and 69% of northeast troops) and trained volunteer parents (for 18% for southcentral

1/ Some discrepancies between results reported in 1990 for the southcentral region and this paper are due to previously incomplete survey data and some errors in data entry, discovered when combining and cleaning data for the two regions.

and 39% for northeast troops) either assist trained BSA leaders or take troops themselves on trips to public lands. About 12% of the troops in each region use college student or other adults to accompany youth during these trips.
Though only 44% of the southcentral respondents answered the question regarding ratio of Scout youth to adults, the ratio (regardless of the level of training of adults) seems to vary quite a bit. Of those who responded, 39% of the troops have one adult for every five Scouts. Fifty-one percent have one adult for every six to ten Scouts. Less than 10% of the troops have only one adult for every 11-15 youth. Youth/adult ratios in the northeast region appear to enable better supervision, with 83% of troops having one adult for every five Scouts and 15% having one adult for every six to ten youth.

The relatively high rate of non-response (56%) to this question in the southcentral region raises the question of "why?" Was it because they did not want to admit to a youth to adult ratio that did not meet BSA standards? If so, such low levels of adult supervision could have major implications for control of Scout behavior during trips to public lands. This does not seem to be a problem in the northeast region.

Types of activities, activity patterns, and the source of trip/ activity planning may all have implications for troop interactions with and impacts on the resource base. In both regions, about 72-75% of all the troops indicate that trips are planned by the adult leaders with some degree of input from the youth. Only about six percent of troops in each region indicate that trips are entirely adult-planned. Another 14-16% in each region indicate that trips are planned primarily by the Scouts themselves. Only a few trips are planned by youth with minimal adult input.

Scout troops take trips to public lands to engage in a variety of activities. Sometimes there is a primary activity; other times they engage in a variety of different activities during the same trip. By far the most frequently engaged in activities in both regions are camping and hiking/backpacking. More south-central troops engage in canoeing and other aquatic activities than do troops in the northeast (40% as compared with 24%). Other activities include nature-related activities, development of Scouting skills, sightseeing, and conservation projects. Less than five percent of the troops mentioned having fun or miscellaneous other activities as the primary trip activity. Within the miscellaneous category, northeast troops tend to indicate more participation in civic or career develop-ment activities than do southcentral troops. (See Figure 2.)

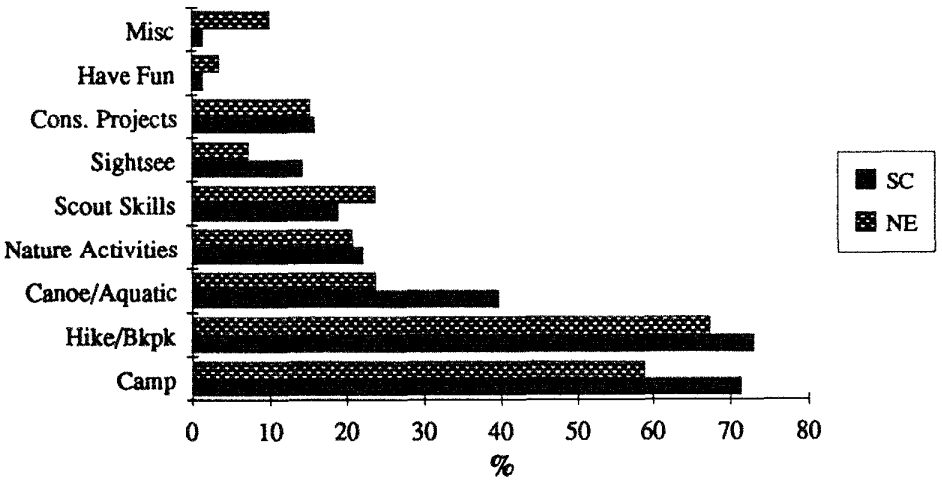

Figure 2. Activities engaged in by Boy Scouts on public lands.

Although troops usually have major programs of activities during their trips to public lands, most troops have some "free" or uplanned time. Most troops (about 98% in the southcentral region and 83% in the northeast) indicate four or fewer hours of free time. About 16% of northeast troops indicate five or more free hours, with almost 4% indicating more than 11 hours of unprogrammed time each day.

Often (for 90% of trips in the southcentral region and for 84% of trips in the northeast) activities engaged in by Scouts during trips to public lands result in their receiving some type of patch or award. Sometimes these are simply place identification patches which serve as souvenirs (13-14% in both regions). Participation awards (received 64% of the time in the southcentral region and 43% of the time in the northeast) also provide souvenir value. Other patches include awards received for demonstration of special skills or achievements. Achievement awards result from 30-32% of trips to public lands in both regions while BSA badges are earned during 24% (southcentral) to 34% (northeast) of the trips. Such patches and badges can serve as motivators for Scouts.

Linking BSA Troops and Public Land Managers
The purposes of other questions in the survey were to determine (1) effective metods of information dissemination to Scout troops, and (2) Scoutmaster perceptions of appropriate troop/ public land management agency interactions.

Responses to questions concerning Scout/management agency interactions suggest that, in addition to provision of facilities and supplies to facilitate troop activities, Scout groups would like to have more frequent and postive interactions with agency personnel. Direct staff involvement with Scouts, provision of programs, and provision of literature and informational services rank second through fourth (each cited by 11-18% of Scoutmasters) behind facility provision. Other troop needs (rule enforcement, reward system, and miscellaneous, or "nothing") identified in both regions follow similar patterns, with the exception that almost 22% of northeast troops indicate a desire for interpretive programs. (See Figure 3.)

Although the majority of Scoutmasters (almost 70% in both regions) report reading all information that they receive from

public agencies. the largest percent of troop leaders share with their troop members only the information that is considered interesting or pertinent. Results indicating that only 11-14% of the leaders in both regions share rules and regulations with boys suggest that this information is not deemed interesting or pertinent. This finding supports other research (Bradley 1981; Christensen 1981; Clark et al. 1972a, 1972b; LaHart and Bailey 1975; Petty and Cacioppo 1981; Ross and Moeller 1974; Roggenbuck and Berrier 1982) suggesting that written information seldom is attended to unless it is particularly interesting to, or needed by, the reader. More direct, personal methods may be needed in disseminating such information as regulations and management policies.

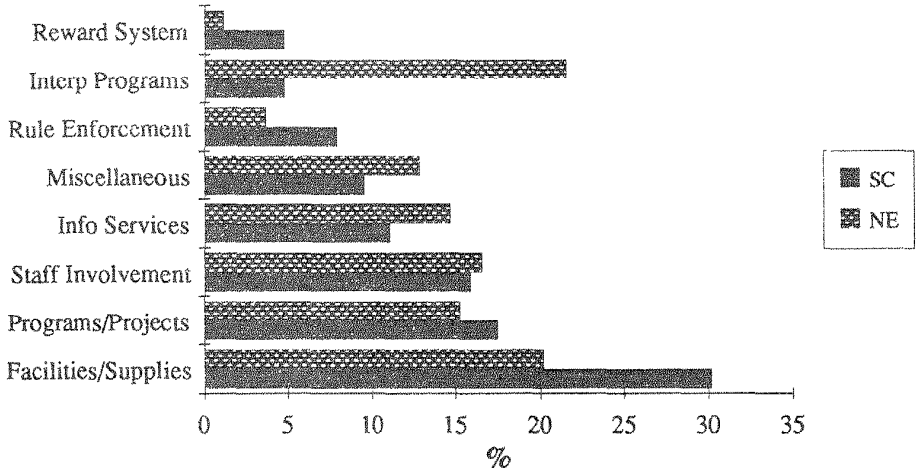

Figure 3. Services which Scoutmasters believe public land managers should provide.

Inappropriate BSA Behaviors Observed by Leaders
Several of the survey questions requested information relating to Scoutmaster perceptions of (1) types of depreciative behavior committed by other Scout or youth groups while visiting public lands, (2) the reasons for inappropriate behavior, (3) effective methods for dealing with young offenders, and (4) effective motivators for appropriate behavior.

Almost 15% of southcentral and 26% of northeast respondents stated they had never seen any Scouts behaving inappropriately while visiting public lands. Others identified a variety of general and specific behaviors engaged in by some Scouts. As observed by Scoutmasters, the most frequently reported inappropriate behavior by Scout groups using public lands was general misuse of and damage to the resources (56% in the southcentral region and 45% in the northeast). Other identified inapporpriate behaviors included: little regard or respect for other visitors (24%/southcentral and 20%/north-east); lack of leader control of Scouts (14%/southcentral and 19%/ northeast); legal violations (11%/southcentral and 1%/northeast); other rule violations (10%/southcentral and 3%/northeast); and miscellaneous actions resulting in a poor Boy Scout image (6%/southcentral and 2%/ northeast). (See Figure 4.)

The four most frequently cited reasons for inappropriate behavior are (1) inadequate leadership and supervision, (2) lack of consistent, enforced behavior standards throughout the year, (3) lack of training (of both Scouts and leaders), and (4) no knowledge or understanding of ageny regulations or expected behavior.

Appropriate & Inappropriate Behavior Motivators
Reflected in the reasons for inappropriate behavior are methods found by Scoutmasters to be most effective in controlling inappropriate behavior. The most frequently mentioned method by southcentral Scoutmasters (though rated considerably less and ranked third by northeast Scoutmasters) is to follow through with disciplinary sanctions (or to use the "big stick" approach). While this method involves post-behavioral sanctions, the other most often identified reasons by southcentral Scoutmasters are preventive. These include (1) keeping youth involved in planned programs or activities, (2) informing youth of and explaining reasons for expected behavior, (3) providing appropriate role modeling by sincere, caring adults, (4) clarifying and adhering to behavioral expectations throughout the year, and (5) using boy-focused techniques such as using the patrol system, activating peer pressure for appropriate behavior, and giving specific responsibilities to the youth. Though northeastern Scoutmasters also cite preventive techniques, they rank them differently. "Keeping them busy" and "providing adequate supervision" are considerably more important. These strategies are followed by (1) using a variety of peer techniques, (2) pre-trip training, (3) enforcing BSA standards, and (4) providing conservation projects. (Figure 5.)

The two factors ranked by Scoutmasters in both regions as the most effective motivators for troop participation in service projects are positive adult reinforcement and providing individual badges and patches. Receiving comparable medium rankings for motivation effectiveness, with slightly a different order in rankings between the two regions, are (1) peer approval, (2) formal verbal recognition, (3) troop awards or certificates, and (4) challenge. Informal verbal recognition is ranked last in effectiveness by Scoutmasters in both regions. (See Figure 6.)

Discussion

As in any research, there are limitations to this study, many resulting from limited researcher control of survey administration and the low response rate to the southcentral region Scoutmaster survey (discussed more fully in Vander Stoep 1990). Most of these problems were resolved with the northeast survey. However, differences in survey administration should be considered when comparing regional results.

Some respondents answered only some of the survey questions, ocassionally leaving open-ended questions unanswered. For such questions it is difficult to know if they were unanswered

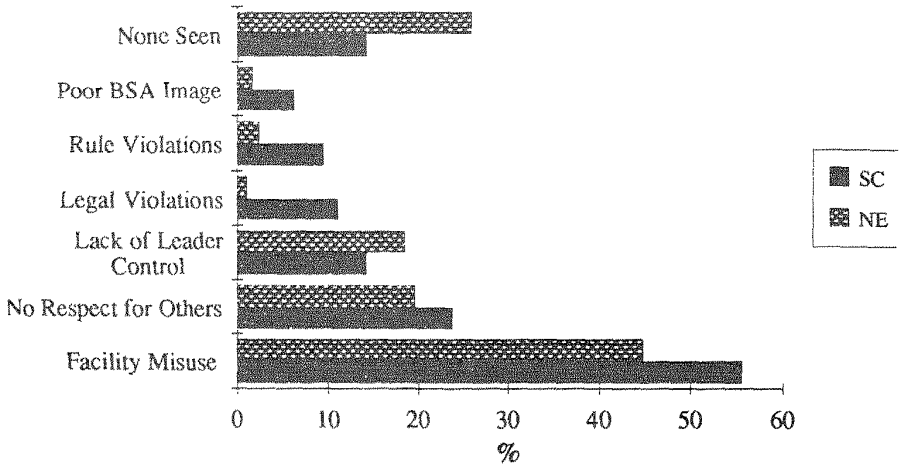

Figure 4. Boy Scout behavior problems on public lands as observed by Scoutmasters.

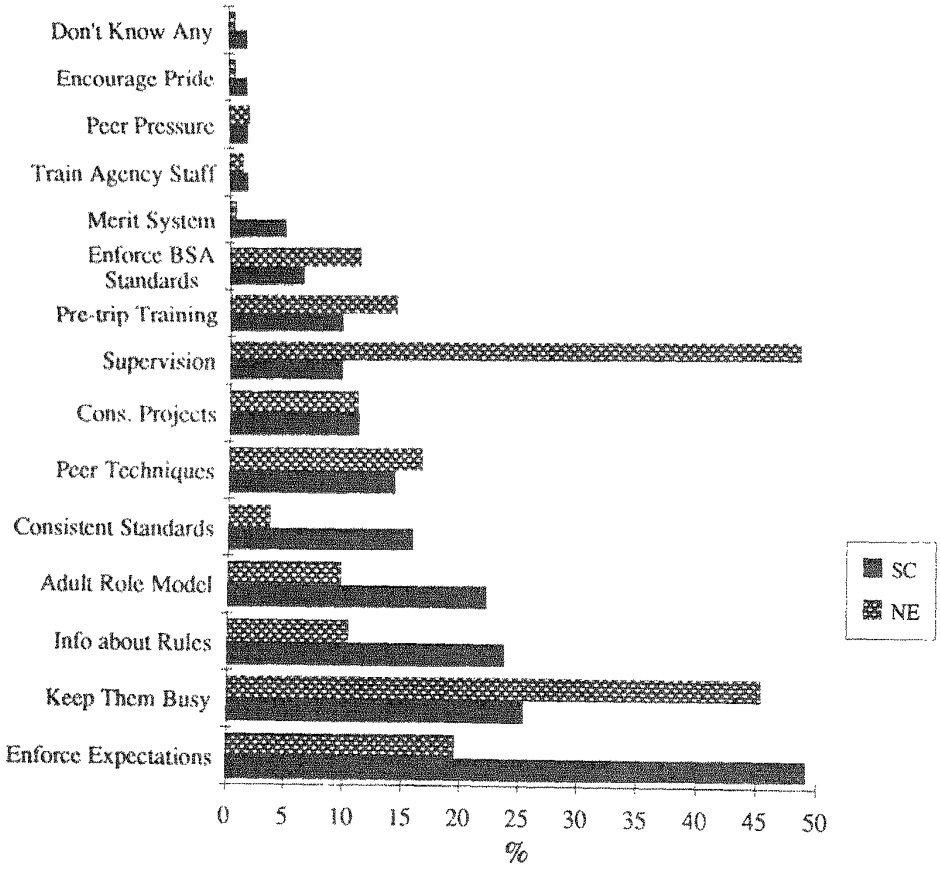

Figure 5. Effective behavior control techniques as identified by Scoutmasters.

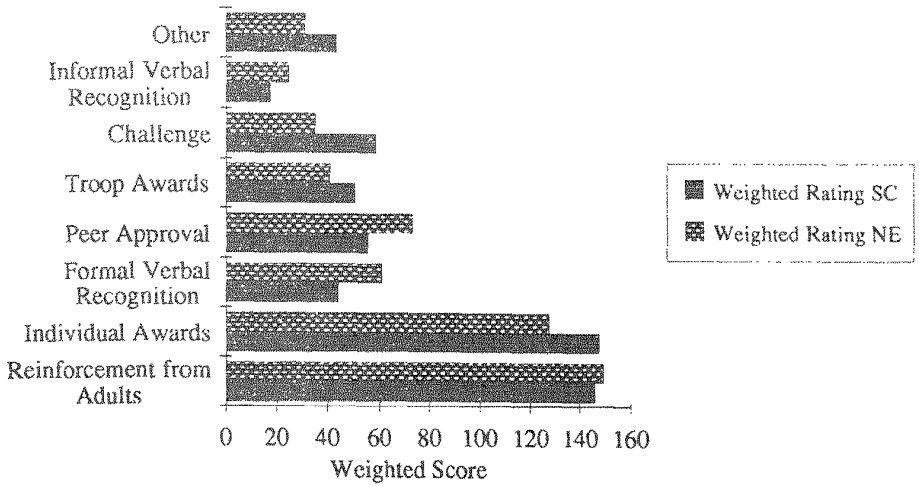

Figure 6. Motivators for appropriate Scout behavior, weighted by respondent rankings.

because they took more effort or because respondents chose not to address the specific issues. Some questions, such as the one asking for the ratio of adults to youth during trips, may have been left unanswered because of potential guilt or embarassment about low levels of adult supervision. If this is the case, low levels of adult supervision could have implications for control of Scout behavior during trips to public lands.

Despite limitations of the survey process, the responses in combination with specific comments made on the open-ended questions provide insights which can be useful to public land managers who work with Scout group users on their sites. Taken together, results indicate that most Scoutmasters in both regions would like increased involvement of public land managers with their troops. Such interactions can occur both prior to and during troop visits to public sites. It should be noted also that many respondents took the time to make additional comments on the back of the survey or requested copies of results (23 in the southcentral region and 58 in the northeast, about 35% of usable surveys in each region).

Implications of Regional Differences in Troop Characteristics

Smaller troops and better adult to youth ratios (increased supervision) during trips to public lands in the northeast may help reduce the amount of depreciative behavior exhibited by Scouts. However, because northeast troops use more volunteer parents (untrained as well as BSA-trained) and because more Scoutmasters tend to have fewer years of experience, troops in this region may be looking for increased interaction with and information and/or programs from public land managers. Several comments and requests for brochures about public lands written on the surveys seem to reinforce this need.

Implications of Regional Differences in Use of Public Lands

Though northeast troops take slightly fewer trips to public lands than southcentral troops, they tend to take more overnight than day trips. Additionally, they tend to have more "free" or unprogrammed time than the southcentral troops which have more experienced Scoutmasters. Again, this may indicate a need for more direct agency involvement and/or programming for Scout troops, or at least more contact and perhaps information/training opportunities for Scoutmasters.

Northeast troops use slightly more local and state areas and considerably more military sites than southcentral troops. This indicates that local as well as state and federal land managers need to be aware of Scout troop needs, behavior and activity patterns. Additionally, northeast troops do more bicycling and winter activities, indicating multi-seasonal Scout use of public lands and participation in corridor activities for which troops may be using public lands during only part of their trips. This can make information dissemination by public land managers more difficult.

General Implications for Public Land Managers

Some things that managers might do in preparation for Scout visits are described below.

Understand the BSA Program and Participants. If new to a specific public site, or new to public land use in general, Scout groups may feel unwelcome or uneasy, either because they are placed away from other visitors, they are not sure what to expect, or because they have no direct contact with agency personnel. In some cases, agency staff may have negative perceptions of or reactions to Scout groups, often due to previous negative experiences or misperceptions. Because Scout groups are highly visible during their visits (groups often are large and Scouts often wear uniforms, making them recognizable), any inappropriate behaviors are noticeable. Scouts might feel more welcome if managers made efforts to understand the Scouting program and troop activities.

Just as important is that Scout leaders make efforts to communicate with managers about their planned activities and schedules, and seek out information about rules, regulations and appropriate behavior for public lands. This information must be relayed to the youth in a positive and justified manner. Perhaps collaborative information-sharing programs could be established between specific land management agencies and a variety of organized youth groups. Development of mutually beneficial on-site and outreach programs could be incorporated.

Identify Site-specific Periods of Intense Scout Use. By identifying periods of heavy Scout use, managers can plan more effectively how to allocate staff, programs, campsites, and other resources. Additionally, they can reduce potential conflict between Scouts and other site users by spatially or temporally separating use or specific activities.

Identify Troop Expectations for Site Use. As is clearly evident in the outdoor recreation literature, visitors whose actual experiences do not match their expectations will be less satisfied with the visit than those whose match. If managers could identify troop expectations (via phone or letter during troop inquiries or site reservations, or during collaborative programs as suggested above), they could better link troops with sites, facilities and programs to meet their needs. Also, they could direct troops to other, more appropriate sites if the agency's site could not adequately accommodate or meet the group's needs.

Use Interpretation to Clarify Appropriate Behavior. Northeast Scout troops appear to want much more information, participatory projects, and interpretive programs than they currently receive. Use of all of these can help disseminate agency information, can contribute to development of environmental ethics, and can provide project help for short-staffed agencies.

Also, groups often engage in inappropriate behavior because they simply are unaware of negative consequences of some behaviors. Informing them, preferably through interpretive strategies rather than through more authoritative or threatening strategies, can reduce negative behaviors as well as promote positive images of the agency. It also can establish positive relations between Scout groups and the agency. Direct personal interactions often are more effective than written regulations. Additionally, messages to guide appropriate behavior and achieve other management goals can be incorporated into other interpretive programs.

Final Comments and Recommendations

Involve Scout Groups in Public Land Projects. Scout groups can become involved in a variety of service and conservation projects such as trail building and maintenance, litter cleanup, bridge-building, and sign painting. Many agencies already participate in such cooperative programs. They often require staff time to plan, coordinate and supervise, but benefits are numerous. They include keeping Scouts active during their visits, accomplishing needed maintenance and management tasks for the agency, improving Scouts' self-image, teaching them new skills, and contributing to development of an appropriate land ethic. The Scouting program is structured to support such service activities. Also, such activities often can be linked directly into an existing award system (particularly with Scout groups), or with an agency recognition program.

Although it may not be feasible, particularly with staff and budget constraints, to assign a staff person to work primarily with Scout and other youth groups, it can be beneficial to ensure that each Scout or other youth group has some type of direct, personal contact with an agency representative. This can take the form of pre-trip phone conversations with a group member or leader, an informal welcome and overview of the site at an entry booth or visitor center, a special interpretive program (such as an evening campfire program) for all youth group visitors at one time, or simply an informal welcome during a patrol through the group campsite.

For sites which receive intensive local Scout troop use, the agency might consider an open house/training session for adult and/or youth leaders. All the issues (as discussed previously) could be addressed in an open and personal manner. Such a program could increase understanding of and appreciation for each others' roles, responsibilities and expectations. It could produce supportive advocacy rather than an adversarial relationship.

Regardless of the package of strategies used, it is important that public land managers and Scout groups communicate openly and personally about their roles, responsibilities and expectations of each other. In this time of increasing use of cooperative ventures between agencies and between public and private sectors, perhaps we should consider also building cooperative ventures between managers and public land users whenever possible. Scout troops provide a ready-made user group for such cooperative programs.

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OUTDOOR RECREATION

OUTDOOR RECREATION II

RECREATIONAL PROGRAMMING IN A FAMILY CAMPGROUND: AN EXPLORATORY STUDY

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The purpose of this study was to determine if recreational programming within family campgrounds was a valid approach to deal with management problems found in public outdoor recreation areas. A survey of 399 respondents at Lieber State Recreation Area (Indiana) showed that programs offered tended to add to overall levels of camper satisfaction. Seventy-two percent of the campers have camped there before an average of 9.6 times in the past five years and 96% of the respondents intend to return.

Introduction

According to Jones (1988, p. 1), "camping has long been a favorite activity of outdoor recreationists." Technological advancement has resulted in a gradual change in the camping industry, as well as in the campers themselves. The concept of "roughing it" is rarely seen in modern camping facilities today (Jones, 1988).

Camping use in both public and private camping areas began to decrease in the mid-1980s. According to Cottrell (1990), "this trend continues today." The reasons are quite complex: decreased funding; lack of emphasis, in some cases a disdain for family campers on the part of management; greater expectations on the part of the user; attempts at privatization at the federal level; greatly increased user fees; and the lack of fun programming, which may contribute to youth boredom in public campgrounds (Cottrell, 1990).

Since visitation to both public and private campgrounds has declined, an assessment of public recreation need in a technologically advanced society is critical for both public and private sector campground managers. Declining use, an increase in camper discrimination when selecting a place to camp, and the increasingly more competitive campground marketplace, mean pleasing the customer is a necessity (Jones, 1988). Obviously, managers should consider a change in the traditional approaches to customer service.

Most camping clientele come from an urban setting, where general knowledge of ecology and nature is rather limited. As noted by Cottrell (1980, p. 38), "research data and recent history tells us that public park camping use is not rural in origin." In fact, most campers are from urban areas and are accustomed to an assortment of recreational activities. Those activities, at the municipal level, typically involve such program categories as arts, crafts, dance, drama, music, sports, games, social events, and some environmental activities.

Community recreation programs serve to enrich family unity by providing activities that encourage entire family participation. Traditional interpretive programs on boating safety and smokey the bear do not provide a comfortable tie to municipal programs (Cottrell, 1990). Therefore, public agencies, for the sake of continuity, might also tailor programs in family campgrounds to encourage entire families to camp together (Hultsman et al., 1987). According to Cottrell (Hultsman et al., 1987, p. 250), "the lack of outdoor recreation programming is the most serious shortcoming of the profession today." Recreational programming can provide familiar activities in an unknown setting, a bridge or stepping stone over the fear of the foreign and of the unknown for those citybred campers who feel out of place in a wooded environment (Cottrell, 1980).

In a recent study involving the factors that influence outdoor recreation participation as outlined by McClaskie, Napier and Christensen (1986), familiarity with an activity or activities in which prior participation produced positive rewards was more likely to breed future repeat participation. Simply stated, people will normally repeat known safe positive experiences. These findings suggest that participation in outdoor activities as a youth may carry over into adult leisure time activities. Therefore, the provision of recreational programs intertwined with interpretive programs might be an avenue for managers to do a better job serving campground visitors as well as enhancing visitor knowledge about the outdoors.

Another study focusing on the relationship between adolescent and adult leisure patterns indicates that a certain percentage of youthful leisure time experiences will carry over into adulthood (Scott and Willits, 1989). Using a longitudinal model, Scott and Willits compared data from 1298 subjects who were studied during their high school days and again when the same subjects were in their fifties. "For the sample members, the greater the involvement in a specific type of activity during adolescence, the more frequent the participation in the same type of activity at midlife" (Scott and Willits, 1989, p. 323). In support of this idea, Kelly (1974, 1978) found that leisure patterns of adults are augmented from childhood leisure time activities and experiences.

Prior recreation program research in family campgrounds is quite limited. One of the first studies in this area was conducted by Winn (1975), who examined the characteristics, camping background, and program preferences of campers at Hillman Ferry campground, Land Between the Lakes in western Kentucky. In 1975, campground occupancy rates at Land Between the Lakes increased eight percent over the 1974 use figures. Interestingly, 90 percent of the teenagers campers had were camping with them. Research being rather limited in this respect, one can only speculate based on authoritative opinion that such high numbers of teenagers camping with their families in Land Between the Lakes may be attributable to the aspect of lots to do. A typical summer week in Land Between the Lakes campgrounds in the mid to late 1970s featured 75 to 100 scheduled activities ranging from sports and games, skills activities, arts and crafts, interpretation, aquatic activities, dancing, and evening campfire programs (Cottrell, 1990). Winn implies that recreational 'fun' programs may increase campground occupancy rates, camper satisfaction, and teenage camping participation.

As a follow up to the Winn project, Hultsman (1977) conducted an applied study looking at teenage program preferences. Of the 96 respondents, 86% had participated in campground programs. Results imply that teenagers, typically a group that park

managers do not program for (Cottrell, 1990), will participate in programs of interest to them

Purpose

The purposes of this study were to: 1) determine if programming within a family campground was important to campers, and how this importance rating relates to overall camper satisfaction, 2) determine if there was a relationship between performance of campground programs and overall satisfaction, and 3) determine if there was a relationship between participation in campground programs and camper feelings towards overall camper satisfaction. The overall intent of this exploratory research was to determine if recreational programming within family campgrounds was a valid approach to deal with management problems found in public outdoor recreation areas.

Methods

Study Setting

Lieber State Recreation Area (LSRA), operated by the Indiana Department of Natural Resources, is located 50 miles due west of Indianapolis, Indiana. Adjacent to Cagles Mill Reservoir, program facilities include a marina, boat docks, boat ramp, swim beach, basketball courts, amphitheater, activity center, hiking trails, and a sports/activity field. Don Albietz (1990), Property Manager, LSRA, says that "recreational programs in the campground have been a solution to several of his management problems in the park." Those problems, typically associated with insufficient generation of revenues, were identified as excessive vandalism and poor visitation rates during the week and on non-holiday weekends. Prior to the 1986 season, campground programming had mostly been interpretation with low camper participation. In 1986, Albietz minimized interpretation and began to incorporate recreational programming into the overall management scheme of LSRA.

Albietz (1990) states that "the implementation of recreational programs in the campground has increased both camping and overall property revenues." Camping revenue declined from 1984 to 1985. Following the advent of the treatment (recreational programming), camping revenue has increased 39% from 1985 to 1989; likewise, overall property revenue has increased 66% from 1985 to 1989. There has only been a marginal increase in user fees from 1987 to 1990. For instance, in 1987, camping fees were $8.00 per site with electrical hookups and $5.00 per site without electricity, which increased to $9.00 per site with electrical hookups and $5.50 per site without electricity in 1989. Likewise, no fees were charged for campground programs. In addition, the incidence of vandalism has decreased ($5,000 in 1985 allocated for repair of damaged property versus $2,000 in 1989).

Data Collection

A twelve-page self-administered questionnaire was used to solicit responses about camper participation characteristics, program attendance patterns, levels of experience satisfaction, and demographics. A stratified systematic sample with a random start represents those campers in camp the last night of their trip. State park rangers and activities staff distributed and collected the surveys on site. Approximately 6% of those campers asked to participate in the study refused to do so. The total of 399 subjects represents the entire camping season from Memorial Day weekend through Labor Day 1990.

Description of Sample

Indiana state residents represent 92% of the user population. Forty-three percent of those campers were from Indianapolis, Indiana. The average distance traveled per camper from Indiana was approximately 53 miles one-way.

The average size group of LSRA campers included five people. Fifty-eight percent of the users were family campers with children while 25% were couples. Forty-four percent of the campers were camping with another group of family members or with friends. The average number of vehicles per group on this trip was 1.76. In addition, there was an average of one boat per group. Tents (62%) were the most frequently used type of camping equipment, followed by fold down campers (17.9%).

When the respondents were asked "do you have children living with you," 66% said 'yes.' The average number of children living with the subjects was 2.2. Over two-thirds (67.9%) of these campers reported having children with them on this camping trip. Approximately three-quarters of the children with families on this camping trip were between one and twelve years old. Of those campers with teenagers living with them, 69% of the teenagers were with them on this camping trip.

LSRA visitors were quite avid campers. Seventy-six percent of the respondents camped in public campgrounds last year while averaging 24 days camping per year in the last five years.

Satisfaction

LSRA campers appear to be quite satisfied with their overall camping experience (Table 1). On a scale of one to ten (with ten being the perfect experience), 88.9% rated their experience a seven or higher. Nearly one-third of the campers rated their experience an eight, and the average satisfaction level was 8.0.

Other variables indicative of campers' overall high levels of satisfaction with the camping experience at LSRA included the high number of return visitors and campers' intent to return. Approximately three-quarters of the respondents have camped at the site before, with the number of visits per camper over the last five years averaging 9.6. When asked if they plan to return to LSRA, 96.1% said 'yes.' Of the 3.9% of the respondents who do not intend to return, 53.3% were just passing through the area enroute to some other destination. Some of the most frequent reasons why campers plan to return were: close to home (24.3%), clean park (16.4%), nice place to camp (15.3%), and we like the park (15.3%). Additionally, 44.8% of the respondents intend to return this year. These findings suggest that campers are very pleased with their camping experience at LSRA. One assumption may be that campers feel welcome, comfortable, and safe. Although not directly measurable, campground programs may be a major contributing factor towards increased feelings of being welcome and increased perceptions of safety.

Table 1. Overall satisfaction of LSRA campers as measured by 10-point satisfaction scale.

Satisfaction Level	Frequency	Percent	Cumulative Percent
2	1	.3	.3
3	2	.5	.8
4	1	.3	1.1
5	20	5.3	6.4
6	19	5.1	11.4
7	74	19.7	31.1
8	118	31.4	62.5
9	84	22.3	84.8
10	57	15.2	100.0
Total	376	100.0	100.0
Mean = 8.0		Median = 8.0	Std Dev = 1.4

Program Participation

Twenty program categories were identified as those structured opportunities scheduled on a weekly basis throughout the summer 1990 camping season. Campers were asked to indicate what program(s) members of their group participated in.

Approximately 67% (N=253) of the respondents indicated that some member of their family had participated in one or more of the programs. Some of the most frequent reasons why campers did not participate in campground programs were because these activities were not why we came here (45.5%) and they did not know of the programs (35.3%).

When asked "Are you familiar with the program activities at LSRA," 60% of the respondents said 'yes.' The relationship between program attendance and camper familiarity with programs was statistically significant at the .001 level (X^2=33.157, df 1). Of those campers familiar with the programs at LSRA, 78% attended campground programs. Likewise, of the 40% not familiar with programs, 49% attended programs as well. The most effective methods of informing campers about the programs were by program brochures given at the main gate (53.3%), the activity center bulletin board (51.5%), and rest room bulletin boards (40.2%).

Approximately 32% of the respondents answered 'yes' to the question "Does the opportunity to participate in various programs influence your family's decision to camp here rather than in other public or private campgrounds?" There was a strong relationship between program attendance and the influence of programs on campers decision to camp at LSRA, which was statistically significant at the .001 level (X^2=25.120, df 1). Among those campers for which program opportunities at LSRA influenced their decision to camp there, 85% attended campground programs. Moreover, of those campers not influenced by program opportunities, 57.5% attended campground programs.

Another finding concerning the independent variable, familiarity with programs, was its relationship to previous camping experiences. This relationship was statistically significant at the .001 level (X^2=18.562, df 1). Two-thirds (67%) of those who had previously camped at LSRA were familiar with its programs, compared to only 43% who had not camped there before.

The relationship between past camping at LSRA and program attendance was statistically significant at the .05 level (X^2=5.286, df 1). Of those campers who had camped there before, 70.6% attended campground programs, while 57.5% of those campers who had not camped there before attended campground programs.

Importance-Performance Analysis

Upon examination of the importance and performance placed on the various activities, there was considerable variance among the different activity means. Table 2 shows the twenty program categories included in the camper survey. Those activities rated 5.0 or above in importance (listed from high to low) were recreation equipment issue (5.8), activity center (5.6), nature hikes (5.6), beach activities (5.5), boat rides (5.4), dances (5.1), and children's movies (5.0). It was surprising to find that campfire programs were not as important to campers as other activities. Interestingly, the only educational/nature oriented activity scoring above the 5.0 rating was the nature hike category. Slides/speakers, rated 3.2, was the lowest of all the program activities, probably because of its lecture oriented connotation.

Table 2. Program activities mean importance-performance ratings.

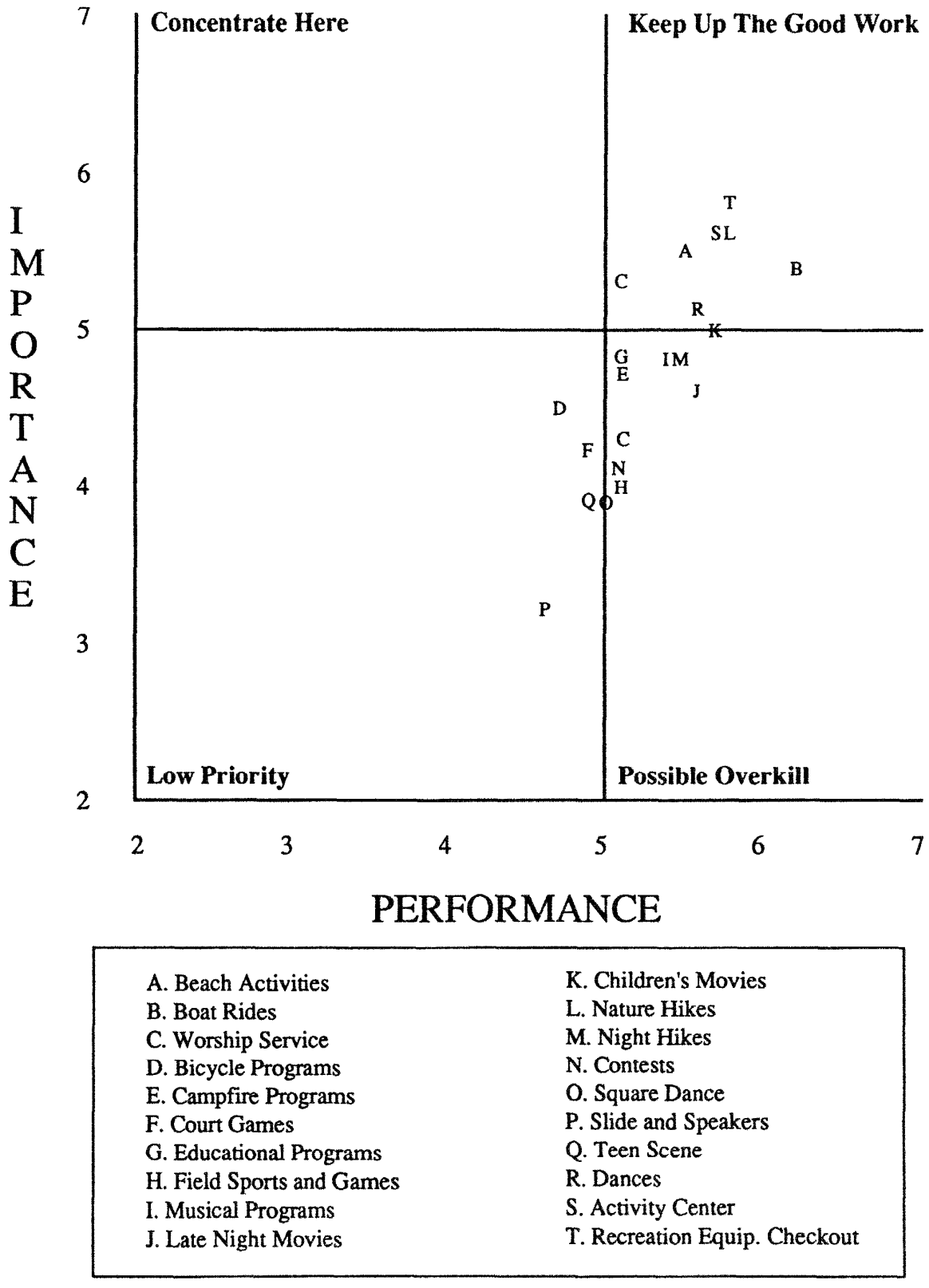
Sym-bol	Program Activity	Importance Ratings Average	N	Performance Ratings Average	N
A.	Beach Activities	5.5	180	5.5	187
B.	Boat rides	5.4	158	6.2	163
C.	Worship Service	4.3	71	5.1	74
D.	Bicycle programs	4.5	61	4.7	65
E.	Campfire programs	4.7	66	5.1	71
F.	Court games	4.2	70	4.9	75
G.	Educational programs	4.8	59	5.1	66
H.	Field sports/games	4.0	62	5.1	65
I.	Musical programs	4.8	72	5.4	77
J.	Late night movies	4.6	77	5.6	82
K.	Children's movies	5.0	72	5.7	74
L.	Nature hikes	5.6	106	5.8	110
M.	Night hikes	4.8	71	5.4	73
N.	Contests	4.1	59	5.1	60
O.	Square dances	3.9	53	5.0	57
P.	Slides/speakers	3.2	47	4.6	52
Q.	Teen scene	3.9	51	4.9	53
R.	Dances	5.1	89	5.6	92
S.	Activity Center	5.6	95	5.7	101
T.	Recreation Equipment Checkout	5.8	99	5.8	105

Note: The sample size for both ratings represents only those campers that participated in each of the programs.

Generally, mean performance ratings were higher than importance ratings (Table 2). For instance, boat rides had the highest rating at 6.2 in performance in comparison to 5.4 for importance. Both recreation equipment checkout and nature hikes (5.8) were the second highest rated activities followed by activity center and children's movies (5.7), dances (5.6), late night movies (5.6), beach activities (5.5), etc. Only four of the activity categories averaged below a five point rating: teen scene, court games, bicycle programs, and slides and speakers.

Figure 1 (see next page) presents the Importance-Performance Action grid for program activities at LSRA. Recreation equipment checkout was evaluated as the most important and well performed item. Bicycle programs, court games, teen scene, slides and speakers were the only four activity items to fall within the "Low Priority" quadrant.

Of the importance variables, the relationships between court games (F=2.20), contests (F=2.28), slides/speakers (F=2.56), and activity center (r=2.44) and the dependent variable, overall camper satisfaction were statistically significant at the .05 level (Table 3). Those respondents reporting higher importance for those programs tended to also report higher overall satisfaction.



A. Beach Activities
B. Boat Rides
C. Worship Service
D. Bicycle Programs
E. Campfire Programs
F. Court Games
G. Educational Programs
H. Field Sports and Games
I. Musical Programs
J. Late Night Movies
K. Children's Movies
L. Nature Hikes
M. Night Hikes
N. Contests
O. Square Dance
P. Slide and Speakers
Q. Teen Scene
R. Dances
S. Activity Center
T. Recreation Equip. Checkout

Figure 1. Importance performance action grid for program activities at Lieber State Recreation Area.

Table 3. Mean values of overall camping satisfaction by importance of the campground programs.

	Not Important 1	2	3	Somewhat Important 4	5	6	Quite Important 7	$\bar{x}$	F-Value
	(111)	(32)	(46)	(63)	(21)	(21)	(21)	(315)	
Court Games	7.8	7.8	7.6	8.2	8.2	8.6	7.8	7.9	2.20*
	(116)	(34)	(41)	(53)	(27)	(20)	(31)	(322)	
Contests	7.8	7.6	7.8	7.9	8.1	8.6	8.5	7.9	2.28*
	(54)	(22)	(29)	(57)	(38)	(39)	(92)	(331)	
Activity Center	7.6	7.9	7.8	8.4	7.7	7.6	8.2	7.9	2.44*
	(138)	(37)	(36)	(55)	(17)	(18)	(15)	(316)	
Slides/speakers	7.9	7.4	8.0	8.0	7.3	8.5	8.6	7.9	2.56*

* Significant at the .05 level
() Values in parenthesis denote sample size

Of the performance variables (Table 4), the relationship between contests (F=3.64) and overall camper satisfaction was statistically significant at the .05 level. Campfire programs (F=3.88) and beach activities (F=4.42) were significant at the .01 level and nature hikes (F=6.92) was significant at the .001 level. Those respondents reporting higher performance for these programs tended to have higher overall satisfaction.

To determine if campers were satisfied with the programs at LSRA, campers were asked to rate their level of satisfaction for campground programs. Campers appear to be quite satisfied with the programs overall. On a scale of one to seven (with seven being the highest), 83% rated their experience a five or above. One-third of the campers rated the quality of the programs a seven, and the mean program satisfaction level was 5.7. As expected, the relationship between program satisfaction and overall camper satisfaction was statistically significant at the .001 level (r=.298).

Although program participation (nominal scale) was not significantly related to overall camper satisfaction, those campers who participated in programs rated overall satisfaction (mean=8.09) slightly higher than those campers who did not participate (mean=7.98) in the campground programs. The relationship between the independent variables of previous experience at LSRA (F=6.43, p=.05), programs influence on decision to camp here (F=7.63, p=.05) and camper intent to return (F=13.39, p=.001) to overall camping satisfaction were all statistically significant (Table 5).

Table 4. Mean values of overall camping satisfaction by performance of the campground programs.

	Mostly Dis-Satisfied 3	Mixed 4	Mostly Satisfied 5	Pleased 6	De-lighted 7	$\bar{x}$	F-Value
	(6)	(14)	(15)	(11)	(13)	(59)	
Contests	7.5	7.6	7.5	8.9	8.7	8.1	3.64*
	(12)	(14)	(10)	(16)	(17)	(69)	
Campfire Programs	7.8	7.4b	8.4	8.3	8.8a	8.2	3.88**
	(20)	(16)	(36)	(66)	(45)	(183)	
Beach Activities	8.1	7.6b	7.9c	7.9d	8.8a	8.1	4.42**
	(3)	(11)	(24)	(38)	(32)	(108)	
Nature Hikes	7.7	7.6b	7.6c	7.9d	8.9a	8.1	6.92***

*Significant at the .05 level
**Significant at the .01 level
***Significant at the .001 level

Scheffe Test: Letter superscripts indicate differences between groups significant at the .05 level.
() Values in parenthesis denote sample size

Table 5. One-way analysis of variance: Mean values of levels of overall camping satisfaction by attendance in programs, previous camping at LSRA, influence of programs on camping decision and intent to return.

		N	$\bar{x}$	F-Value
Level of Overall Camping Satisfaction				
Attendance	Yes	244	8.09	ns
at Programs	No	115	7.98	
Previous Camping	Yes	278	8.12	6.43*
at LSRA	No	97	7.70	
Influence of Programs on	Yes	113	8.30	7.63**
Camping Decision	No	239	7.86	
Intent to Return	Yes	357	8.11	13.39***
	No	8	6.38	

*Significant at the .05 level
**Significant at the .01 level
***Significant at the .001 level

Conclusions

Upon review of camping participation at Lieber State Recreation Area, apparently most of the subjects like to camp there. Data show the park to be clean, safe, as well as desirable for family campers. These attributes were demonstrated by: 72% of the campers have camped there before on the average of 9.6 times in the past five years; 96% of the campers intend to return of which 45% intend to return during the same calendar year; over two-thirds of the respondents with children living with them had those children on this trip, and 69% of those people with teenagers living with them had those teenagers on this trip.

In summary, programs offered at LSRA tend to increase overall levels of camper satisfaction. As program satisfaction increases, so does the overall satisfaction of campers with the camping experience. These findings present implications for the use of program satisfaction as a management tool for indirectly manipulating overall camper satisfaction. By focusing management action on the types of programs offered and on types of activities the user prefers, overall camper satisfaction should increase. Continual effort is necessary, however, to monitor and assess user participant patterns, program interests, trends, and camper satisfaction. For simplification, individuals seek alternatives of interest to them. The availability of freedom of choice results in happy, healthy individuals, "the happy camper." The notion of the happy camper could mean return visitation, increased revenue, ... and ultimately, a happy management team.

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FEAR IN THE OUTDOOR ENVIRONMENT: DESCRIPTION AND MODIFICATION THROUGH RECREATION PROGRAMS

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Using the Situational Fear Inventory, outdoor course participants identified the degree to which they experienced social-based and physical-based anxieties at the beginning, middle, end of their course. Levels of social-based fears were higher and more resistant to modification. Females expressed higher levels of fears. Most fears were reduced significantly through program participation.

Introduction

One interesting aspect of recreational activities taking place in a natural environment is the "push and pull" attributes of the experience. Similar to the dialectical view of leisure behavior (Iso-Ahola 1980:135), for some of the outdoor recreation experience provides a number of appealing attributes while also presenting some challenging and anxiety-producing situations. Bass (1989) reports that this dualism in the outdoor recreation experience epitomizes a coming to terms with the subjective feelings experienced through situations that are challenging and with unexpected outcomes. For many, these outdoor recreation experiences are first experienced through a structured educational program taking place in a natural environment (Kaplan and Kaplan 1989:121).

In an earlier study, Ewert (1988) identified situational fears before, immediately after, and one year following participation in Outward Bound, a wilderness challenge program. In addition, he found that individuals reported reduced levels of situational anxieties following participation in the program.

The purpose of this study was to identify and measure the levels of situational fears and anxieties held by participants of a different type of outdoor program and to measure fears during as well as before and after the course. Because gender was identified as an intervening variable in the previous study (Ewert 1988), this study was also designed to determine if males and females report different levels of anxieties at the beginning, the middle, and end of the course. Based on the literature and past findings (Leary 1982; Gray 1987) it was expected that the items representing social-based fears (e.g., fear of confrontation in the group) would be rated more anxiety-producing than those representing physical fears (e.g., falling or becoming injured). It was also hypothesized that females would report higher levels of fear than males. Finally, based on the cognitive restructuring model (Beck 1976), it was hypothesized that levels of anxiety would decrease significantly throughout the course.

Methods

Subjects in the study were college recreation and physical education majors completing separate, but similar Outdoor Education Practicum (OEP) courses at the Cortland College Outdoor Education Center in the Adirondacks. As mentioned, the OEP courses are notably different from the Outward Bound courses of the earlier study. The course, which runs for 13 days, includes a 5 or 6 day "pretrip" period at the Center and a 5 or 6 day extended canoe and/or backpacking trip in various wild forest areas of the Adirondack Park. The pretrip period at the Center is operated on a schedule that emulates life in a traditional, centralized summer camp. Activity periods are devoted to teaching camping skills and environmental awareness that will enhance students' readiness for and enjoyment of the subsequent trip. The trips take place in remote areas and require primitive camping and traveling skills. Although involving physical and emotional stress, neither the trips nor the in-camp, pretrip experiences center around the systematic progression of challenges associated with the "Outward Bound" formula. The purpose of the OEP is to improve students' appreciation of the natural environment and to complement their professional preparation with knowledge and skills related to centralized camping, trip camping, and outdoor pursuits. Although differing programmatically and objectively from Outward Bound, the OEP, like Outward Bound, has been found to effect significant changes in self-concept (Young and Steele 1989).

Subjects completed a version of the Situational Fear Inventory (Ewert 1988) (1) upon arrival at the Center, (2) after completing the in-camp pretrip phase, and (3) following their backcountry trip. In completing the instrument, students responded to 33 potentially fearful situations by placing a slash (/) across a 10 cm. line ranging from "not at all anxious" to "very anxious." The measured distance from a zero point to a slash mark provided a numerical expression of the level of fear. A number of research questions were addressed in this study including the effects of pretesting. This report, however, is designed to provide a description of the type and level of fears expressed and the influence of gender. To determine any significant differences between the data, one-way ANOVAs with post-hoc Scheffe tests were utilized.

Findings

Across two summer seasons (1989-1990), individuals from eight courses consisting of 42 different trip groups were queried. From this sample, 380 usable questionnaires were obtained. Based on these data, the first hypothesis (social fears would be more anxiety-producing than physical-based fears) was supported. Figure 1 depicts the consistently higher average level of all social fears compared with physical fears at each point of measurement. A similar pattern is apparent when one compares the number of elevated mean scores (e.g., above 40.0) in Table 1 (social) with those of Table 2 (physical). The frequency of elevated social fears (26) is greater than that of physical fears (11) $\chi 2$ (1, N = 168) = 10.844, $p < .001$.

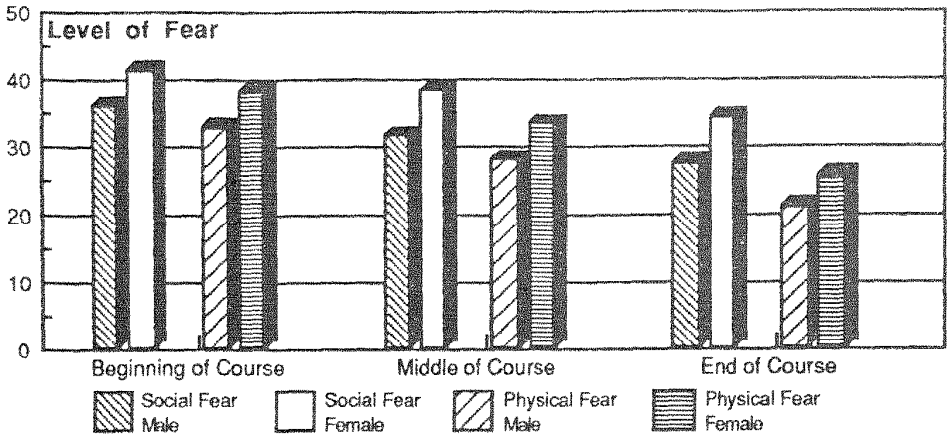

Figure 1. Average levels of social based and physical fears of males and females at the beginning, middle and end of course.

Table 1. Changes in social-based fears of outdoor program participants.

Expressed Fear	Gender	Means Pre-Course	Means Mid-Course	Means End of Course	F Value	P	Difference
Unable to Control Social Environment	Male	37.9	32.8	25.7	12.8	.00	Pre/Middle-Post
	Female	38.9	35.9	30.4	5.1	.01	Pre-Post
Exposure to Unexpected Situations	Male	42.3	38.5	29.6	11.9	.00	Pre/Middle-Post
	Female	46.4	45.9	33.8	14.0	.00	Pre/Middle-Post
Making Wrong Decisions	Male	43.0	38.1	31.6	9.7	.00	Pre-Middle-Post
	Female	49.0	47.7	40.1	5.8	.00	Pre-Middle-Post
Letting Self Down	Male	40.3	35.5	31.7	4.5	.01	Pre-Post
	Female	49.4	47.3	43.7	1.5	.22	No Difference
Letting Others Down	Male	49.9	44.2	39.9	5.6	.00	Pre-Post
	Female	57.4	56.2	53.3	0.8	.44	No Difference
Task Too Demanding	Male	42.5	35.1	26.3	20.2	.00	Pre-Middle-Post
	Female	46.4	43.6	33.3	12.5	.00	Pre/Middle-Post
Confrontation With Others	Male	32.0	28.7	26.3	2.4	.09	No Difference
	Female	35.1	31.0	30.6	1.3	.29	No Difference
Going Unrecognized in Group	Male	31.1	26.1	25.0	3.4	.04	No Difference
	Female	34.7	29.7	29.4	1.8	.17	No Difference
Not Performing Up to Group Expectations	Male	39.0	33.0	31.2	4.1	.02	Pre-Post
	Female	50.0	45.6	40.6	4.5	.01	Pre-Post
Not Fitting in With Group	Male	35.2	31.1	28.8	2.8	.06	No Difference
	Female	41.3	36.7	35.0	2.0	.14	No Difference
Not Performing Up to Leader Expectations	Male	38.7	35.1	31.5	3.3	.04	No Difference
	Female	45.6	44.5	40.9	1.2	.31	No Difference
Being Sexually Harassed	Male	18.0	14.0	13.7	2.1	.12	No Difference
	Female	28.6	23.1	23.0	1.5	.22	No Difference
Not Getting Money's Worth	Male	28.9	26.4	22.0	3.5	.03	No Difference
	Female	27.3	21.7	21.1	2.3	.10	No Difference
Course Not Meeting Expectations	Male	26.5	23.7	22.5	1.3	.27	No Difference
	Female	29.9	27.7	24.2	1.9	.15	No Difference

Table 2. Changes in physical-based fears of outdoor program participants.

Expressed Fear	Gender	Means			F Value	P	Difference
		Pre-Course	Mid-Course	End of Course			
Unable to Control Physical Environment	Male	39.6	37.9	25.4	17.9	.00	Pre/Middle-Post
	Female	42.5	40.4	32.3	6.9	.00	Pre/Middle-Post
Bad Weather	Male	35.0	33.7	21.3	15.89	.00	Pre/Middle-Post
	Female	42.6	38.6	23.0	23.4	.00	Pre/Middle-Post
Poisonous Plants	Male	29.6	21.7	15.9	15.3	.00	Pre-Middle/Post
	Female	33.9	27.3	18.0	15.7	.00	Pre/Middle-Post
Poisonous Snakes	Male	36.2	26.9	21.6	11.4	.00	Pre-Middle/Post
	Female	48.4	38.6	31.3	9.5	.00	Pre-Post
Darkness	Male	27.7	23.1	17.9	7.2	.00	Pre-Post
	Female	31.3	27.8	22.6	4.3	.01	Pre-Post
Dangerous Animals	Male	38.6	33.7	22.7	16.1	.00	Pre/Middle-Post
	Female	47.1	41.0	29.6	14.9	.00	Pre/Middle-Post
Insects	Male	42.7	38.7	29.8	9.4	.00	Pre/Middle-Post
	Female	46.1	44.3	37.3	3.5	.03	No Difference
Becoming Sick	Male	31.0	26.1	22.3	6.0	.00	Pre-Post
	Female	35.6	32.1	25.3	6.0	.00	Pre-Post
Fast or Deep Water	Male	30.1	26.2	20.0	8.0	.00	Pre-Post
	Female	37.9	31.4	26.7	5.9	.00	Pre-Post
Becoming Lost	Male	35.7	29.3	20.7	17.0	.00	Pre/Middle-Post
	Female	41.9	37.1	30.1	7.2	.00	Pre-Post
Getting Dirty	Male	21.3	17.7	12.5	8.0	.00	Pre-Post
	Female	19.4	16.4	11.4	6.5	.00	Pre-Post
Inadequate Clothing	Male	30.0	28.3	21.5	6.4	.00	Pre/Middle-Post
	Female	36.3	35.9	24.7	10.4	.00	Pre/Middle-Post
Not Enough Training	Male	29.8	22.9	21.5	6.4	.00	Pre-Middle/Post
	Female	40.9	30.7	26.8	11.8	.00	Pre-Middle/Post
Insufficient Food	Male	31.4	27.4	23.8	4.1	.02	Pre-Post
	Female	34.7	28.0	22.7	7.7	.00	Pre-Post
Cold/Hot Temperatures	Male	31.6	27.3	19.6	12.7	.00	Pre/Middle-Post
	Female	32.9	31.2	23.6	5.7	.00	Pre-Post

The data indicated that gender was an important mediating variable in all three levels of measurement (beginning, middle, and end of course), with females consistently reporting higher levels of anxiety (see Tables 1 and 2). These findings were particularly pronounced in the items of "letting others down," "not performing up to group expectations," and "letting myself down." In these cases and particularly for females, the level of fear remained relatively high. Comparing the occurrences of elevated (i.e., <40.0) fears of women and men in Table 3, the differences were significant $\chi 2$ (1, N = 174) = 18.16, p <.001.

Table 3. Frequency of elevated fears levels of males and females.

	Fear Level		
Gender	> 40	< 40	Total
Females	30	57	87
Males	7	80	87
Total	37	137	174

a/χ^2 (1, N = 174) = 18.16, p <.001.

The data also supported Hypothesis 3 with levels of anxiety consistently lessening with later measurements. All fear levels were reduced; 71.6% were reduced significantly (p <.05). In most instances, the degree and significance of fear reductions were similar for men and women. The timing of the significant change (pre- to mid- and mid- to post-course) varied more widely.

As indicated in Table 4, the social fears, found earlier to be higher, were also more difficult to change. All physical fears, except the female's anxiety about insects, changed significantly. In contrast, only 12 (42.9%) of the social anxieties were reduced significantly.

Table 4. Frequency of significant change in levels of social and physical fears.

	Significance		
Fear	<.05	>.05	Total
Social	12	16	28
Physical	29	1	30
Total	41	17	58

a/χ^2 (1, N = 58) = 20.24, p <.001.

Implications

There are two sets of implications relative to the findings of this study. From a marketing and programmatic perspective, useful information can be gained by knowing what participants of structured natural environment and wilderness-challenge programs fear. As has been reported in past research, the findings of this study suggest that the social-based fears such as not meeting the expectations of others are more anxiety-producing than the physical-based fears. Further, this study found that the social-based fears are more resistant to change. It would seem that learning facts and skills and completing the experience alleviate most physical fears. The persistence of some social fears (e.g., not fitting in with the group) may stem from the students' doubts about their acceptance by their group in the course. Or, it may stem from the knowledge that acceptance by their course group does not necessarily assure them of acceptance by the next group with which they travel or work. These points and the item-specific findings may suggest ways some providers of these courses can market and deliver wilderness-challenge and similar programs (Goodale 1985:359).

From a sociological perspective, the findings support past work that suggested that females report higher levels of fear in outdoor programs such as the one studied than do males. These differences were particularly evident in the "letting down" variables. While reassuring in the sense that the data are in line with past research, the findings are disturbing in another sense. Despite the common belief that attitudes about leisure and recreation were becoming less differentiated based on gender (Ibrahim 1991), the differences reported in this study suggest that with respect to fear in outdoor programs, there may be persistent and widespread differences between men and women. Although this trend was first ascribed to more honest responses on the part of females (Ewert 1988), the strength of these differences suggest that a powerful phenomenon may be in play-perhaps social learning. If social learning is an influencing factor in the development of fears, particularly among females, programs such as the one studied can play an important role in reducing those fears. From the broader context of society, the true value in programs such as this one may lie more in the modification of fear and feelings of inability and less in the learning of any particular skill or technique.

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MONITORING THE VISITOR EXPERIENCE AT BUCK ISLAND REEF NATIONAL MONUMENT

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This paper examines relationships between visitor density levels and perceptions of crowding at a Caribbean coral reef. Reef visitors were more likely to report that the quality of their experience was enhanced, rather than reduced, by their encounters with other visitors. Perceived crowding was related to visitors' previous experience and the location of encounters with other visitors as well as various density-related measures.

Introduction

Buck Island Reef National Monument is a small undeveloped island adjacent to St. Croix in the U.S. Virgin Islands. One of the main attractions at Buck Island is an "underwater trail" designed by the Park Service to allow visitors to snorkel through coral formations and view marine life guided by interpretive signs. The trail can only be reached by boat. Although both private and commercial boaters frequent the trail, the typical user buys a space on a commercial outfitter's sailboat or motorboat and is ferried the eight miles from St. Croix to one of eleven moorings at the trail just off Buck Island. There, visitors snorkel on and near the trail for an hour or more and then move to the beach for a picnic or sunbathing before returning by boat to St. Croix.

This paper is derived from a study commissioned by the National Park Service to examine the quality of the visitor experience at Buck Island Reef. Park management expressed the view that current conditions were generally acceptable, but they were worried about future impacts resulting from growing numbers of tourists visiting the area. The main objective of the study was to document current conditions in order to provide a baseline against which future changes could be assessed. Accordingly, the study measured selected indicators of quality in the visitor experience and examined the relationships between these indicators and various density-related and background variables.

Study Methods

The data set used for this paper was derived from a 1988 survey of visitors to Buck Island Reef National Monument. Data were gathered from over 1,000 visitors through a self-administered questionnaire completed during their return boat trips from Buck Island. Various measures of visitor density and perceived crowding were employed, the most novel of which was perceived "busyness." This term was used at the request of Park Service staff who preferred it to the value-laden term, "crowding". In light of the experimental nature of this variable, an additional indicator was employed to measure perceived crowding. Visitors responded to the question, "Please circle the number that best describes how the visitors you encountered Buck Island affected your overall experience?" Response categories ranged from "increased my enjoyment" (1) to "no effect" (5) to "reduced my enjoyment" (9). This allowed for n only negative (i.e. crowded) responses but also responses fro visitors whose overall enjoyment was actually increased by t others they encountered. This measure has been used in previous studies (Ditton, Fedler, and Graefe 1983; Drogin, Graefe, and Titre 1990) as an alternative measure of crowding that avoids the possible confounding effects of using the wor "crowding," yet measures the perception of crowding in a manner consistent with the term's conventional definition.

Respondents were categorized into three groups based on thei responses to the 9-point "influence of others" scale. Those responding with one through four were grouped into an "increased enjoyment" group, those responding with a five (' effect") were classified as a "neutral" group, and those responding six through nine were grouped into a "decreased enjoyment" (crowded) category. One-way analysis of varianc tests were employed to determine if these groups varied significantly in terms of variables related to perceived visito densities and selected aspects of visitors' experience levels a types of trips. These same predictor variables were then ente into a multiple discriminant function analysis in an attempt t predict membership in the three groups. A further analysis w carried out after collapsing the three groups into two by combining the increased enjoyment group with the neutral group to form a single "noncrowded" category. Minimum Wilk's Lamda was used as the selection criteria for entry of variables into the discriminating function.

Results

Consistent with the original perceptions of park staff as well the results of many previous studies, few of the Buck Island visitors felt crowded. Only 10% of the 1,083 respondents reported that the others they encountered decreased their enjoyment. Fifty-seven percent reported that others had no effect on their experience and 33% experienced increased enjoyment as a result of the others they encountered.

There were significant differences among the three groups in terms of all five density-related variables considered (Table 1 Interestingly, those who reported that their enjoyment had b increased by the others they encountered reported having significantly more people on their boats than those from the crowded and neutral groups. On the other hand, the crowded group reported seeing significantly more snorkelers on the t and perceived the beach and the trail to be significantly "busi than both the group whose enjoyment had been increased by others and the neutral group. The crowded group also reporte seeing significantly more boats moored at the trail than the increased enjoyment group.

Three of the four experience and trip-related variables also produced significant differences among the three groups. Th crowded group had significantly more snorkeling experience than the other two groups and was more likely to have visite the island before. Those whose enjoyment was increased ten to visit the island for significantly longer periods of time (m full-day trips as opposed to half-day excursions) than did the neutral group. The neutral group was slightly older than the other two but not significantly so (Table 1).

Table 1. Density level, experience, and trip-related variables by how visitors encountered affected overall experience.[1]

	Effect on Experience			
	Increased Enjoyment	Neutral	Decreased Enjoyment	F Value
Density-Related Variables				
Number of people on boat	21.92[a]	19.43[b]	19.16[b]	7.88***
Number of other boats at mooring	4.49[b]	4.67[ab]	5.28[a]	4.43*
Number of snorkelers seen on trail	19.63[b]	19.29[b]	24.45[a]	5.17**
How "busy" the trail felt[2]	4.82[b]	4.77[b]	6.06[a]	23.81***
How "busy" the beach felt[3]	3.61[b]	3.62[b]	5.43[a]	52.97***
Experience and Trip-Related Variables				
Snorkeling experience level[4]	1.69[b]	1.77[b]	2.05[a]	12.89***
Prior visits to Buck Island[5]	.20[b]	.20[b]	.30[a]	3.90*
Visitor's age[6]	2.52	2.64	2.60	1.31 ns
Length of trip[7]	1.52[a]	1.44[b]	1.48[ab]	3.66*
Sample Size	358 (33%)	616 (57%)	109 (10%)	

* p<.05; ** p<.01; *** p<.001

Means with different superscripts are significantly different at the .05 level.

[1] Variable coded on a 9-point scale ranging from "increased my enjoyment" (1) to "decreased my enjoyment" (9).
[2] Variable coded on a 9-point scale ranging from underwater trail was "not at all busy" (1) to "extremely busy" (9).
[3] Variable coded on a 9-point scale ranging from beach was "not at all busy" (1) to "extremely busy" (9).
[4] Variable coded as "beginner" (1), "intermediate" (2), and "advanced" (3).
[5] Variable coded as "no previous visits" (0) and "have visited before" (1).

Multiple discriminant analysis was employed in an attempt to predict the membership of these three groups. How busy the beach felt was the most powerful predictor variable followed by the visitors' level of snorkeling experience. Overall, seven of the nine variables entered the discriminant function (Table 2). However the predictive value of the resulting function was quite weak. Less than 45% of the cases were successfully classified into their correct groups. The group whose enjoyment was reduced due to the influence of others (i.e. the crowded group) was more likely than the other two groups to be classified correctly (64 percent versus 35 percent and 52 percent for the neutral and increased enjoyment groups, respectively).

Table 2. Results of discriminant analysis classifying visitors into increased enjoyment, neutral, and decreased enjoyment groups.[1]

Classification Variable	Discriminant Coefficient	Wilk's Lamda
How busy the beach felt	.852	.932***
Snorkeling experience level	.322	.920***
Number of people on boat	-.179	.912***
Length of trip	-.194	.908***
Number of snorkelers seen on trail	.229	.904***
Visitor's age	.058	.901***
Prior visits to Buck Island	.121	.898***

*** p<.001

CLASSIFICATION RESULTS

Actual Group	n	Predicted Group Membership: Increased Enjoyment	No Effect	Decreased Enjoyment
Increased Enjoyment	363 (33%)	51.5%	24.2%	24.2%
No Effect	633 (57%)	37.3%	35.2%	27.5%
Decreased Enjoyment	112 (10%)	17.9%	17.9%	64.3%

Percent of Total Cases Correctly Classified: 43.5%
N=1,108

[1] Includes only significant variables included in discriminant function.

Because the initial analysis revealed few differences between the increased enjoyment and neutral groups, these two were combined into a single "noncrowded" category for additional analysis. Two of the statistically significant relationships from the three-group analysis became non-significant when the cases were grouped into only crowded and noncrowded categories. Now, the crowded and noncrowded groups did not differ significantly in terms of number of people on their boats or the length of their trips (Table 3). However, after combining the increased enjoyment and neutral groups, the predictive power of the discriminant function was dramatically improved. Seventy percent of the visitors were correctly classified into their appropriate crowded or noncrowded categories (Table 4). Of the five variables entering this discriminant function, the "busyness" of the beach and snorkeling experience level remained the most powerful predictors of group membership.

Table 3. Density level, experience, and trip-related variables by how visitors encountered affected overall experience.[1]

	Effect on Experience: Increased or Neutral Enjoyment (Noncrowded)	Decreased Enjoyment (Crowded)	F
Density-Related Variables			
Number of people on boat	20.37	19.16	1.51 ns
Number of other boats at mooring	4.60	5.28	7.59**
Number of snorkelers seen on trail	19.41	24.45	10.25**
How "busy" the trail felt[2]	4.79	6.06	47.49***
How "busy" the beach felt[3]	3.62	5.43	106.02***
Experience and Trip-Related Variables			
Snorkeling experience level[4]	1.74	2.05	22.20***
Prior visits to Buck Island[5]	.20	.30	7.81**
Visitor's age[6]	2.60	2.60	0.00 ns
Length of trip[7]	1.47	1.48	0.00 ns
Sample Size	974 (90%)	109 (10%)	

* p<.05; ** p<.01; *** p<.001
N=1,083

[1] Variable coded on a 9-point scale ranging from "increased my enjoyment" (1) to "decreased my enjoyment" (9).
[2] Variable coded on a 9-point scale ranging from underwater trail was "not at all busy" (1) to "extremely busy" (9).
[3] Variable coded on a 9-point scale ranging from beach was "not at all busy" (1) to "extremely busy" (9).
4 Variable coded as "beginner" (1), "intermediate" (2), and "advanced" (3).
[5] Variable coded as "no previous visits" (0) and "have visited before" (1).

Conclusions

Overall, visitors' feelings about how the others they encountered affected their enjoyment were not surprising. Ten percent of the Buck Island visitors reported being crowded while 33% reported increased enjoyment and the majority (57%) reported that others had no affect at all on their enjoyment. Using the same 9-point scale, Ditton, Fedler and Graefe (1983) found similar proportions among river floaters on the Buffalo River in northern Arkansas (22% reported decreased enjoyment, 27% increased enjoyment, and 51% felt their trip was unaffected by the others they encountered). The fact that even fewer Buck Island visitors reported crowding than did users of the Buffalo River may be related to the Buck Island visitors' expectations. The Buffalo River is floated by small groups in rafts, canoes, and kayaks while Buck Island is generally accessed by commercial "head boats" that often carry twenty or more people at a time. Such a visitor certainly expects to be in contact with others and may adjust other trip expectations accordingly (Heberlein et al. 1979 and Schreyer and Roggenbuck, 1978).

Table 4. Results of discriminant analysis classifying visitors into noncrowded and crowded groups.[1]

Classification Variable	Discriminant Coefficient	Wilk's Lamda
How busy the beach felt	.883	.933***
Snorkeling experience level	.266	.925***
Number of snorkelers seen on trail	.209	.922***
Number of previous visits	.166	.920***
Length of trip	-.163	.918***

*** p<.001

CLASSIFICATION RESULTS

Actual Group	n	Predicted Group Membership: Noncrowded	Crowded
Noncrowded	1,011 (90%)	70.3%	29.7%
Crowded	115 (10%)	33.0%	67.0%

Percent of Total Cases Correctly Classified: 70.0%
N=1,126

[1] Includes only significant variables included in discriminant function.

Another consistency between the Buck Island results and those obtained using the same scale at the Buffalo River is the finding that the neutral and increased enjoyment groups were very similar. The dramatic improvement in the predictive power of the two-group discriminant function over the three-group function is an indication of how similar these two types of users were. In other words, the three-group discriminant function had a very difficult time distinguishing between increased enjoyment users and neutral ones. Those whose enjoyment was increased by the others they encountered and those who reported that others had no affect on their enjoyment clearly had a great deal in common, with only two significant differences emerging between these two groups. Consistent with other studies, however, both of these groups were different from those who experienced crowding.

As has been found in previous studies, the experience level of Buck Island users and their experience with the setting itself were significantly related to how the presence of others affected their enjoyment (e.g., Vaske et al. 1980 and Nielsen et al. 1977). Members of the crowded group were significantly more experienced as snorkelers and with Buck Island than members of either of the other two groups. These findings again are consistent with those obtained at the Buffalo River and may indicate that more experienced users are either more sensitive to the presence of others or that conditions in the area had changed since their previous visits or perhaps an interaction of these two effects.

There are two apparent inconsistencies between the results of this study and previous ones. Both of these differences relate to the densities of other users reported by visitors and how these densities seemed to affect these visitors' experiences. Previous literature has found only a weak and indirect relationship between the density of other users and perceived crowding and satisfaction (e.g. Absher and Lee 1981). The first inconsistency with these previous findings is the result that the increased enjoyment group actually had *more* people on their boats than those who reported being crowded. This might be explained by visitors adjusting their expectations to make the best of the relatively high densities on many of the commercial "head boats." The fact that several of the companies operating these tours serve drinks and other refreshments on their return trips indicates that they recognize the importance of enhancing these social interactions. It may also be true that these tours simply attract customers who are more gregarious in nature or who are at least willing to tolerate the presence of others.

The second unexpected result was the finding that the perceived density of others *on the beach* at Buck Island seemed to be highly related to visitors perceptions of crowding. In fact, "how busy the beach felt" was the single best predictor of how other people affected the visitors' experiences in both the two-group and three-group analyses. Those from the crowded group consistently reported seeing the most people on the beach. This was surprising in that the original concern leading to the study was with crowding on the water and at the snorkeling trail. However, both of these unexpected findings may reflect the theory that recreationists' sensitivity to crowding varies depending on the location of the contacts (Stankey 1973; Badger 1975). In the case of Buck Island, it may also relate to the nature of the overall experience and the specific activities in which visitors engaged.

The typical excursion to Buck Island can be viewed as three separate experiences: the boat trip out and back, the snorkeling experience on the underwater trail, and the experience on the island's beach itself. As mentioned earlier, visitors appeared to regard the boat trips as social experiences where the presence of others often increased their enjoyment. While the crowded group did see significantly more people on the trail and regard it as significantly "busier" than did the other two groups, they seemed to be less sensitive to the density of others on the trail than on the beach. This may suggest that many snorkelers felt safer while underwater if others were present. This is probably particularly true of the many beginner snorkelers who made the trip. However, once visitors arrived at the beach, the safety factor was much less potent and visitors became more sensitive to the presence of others.

Finally, this study suggests several implications for further research. First, it provides additional evidence that measuring a broad range of possible effects that others might have on recreationists' experience is more meaningful than simply focusing on the negative dimension of perceived crowding. Secondly, the findings support the notion that perceived crowding is related to experience level, location of contact, and visitor expectations as well as the numbers of other visitors encountered. Finally, this study shows that our understanding of recreational crowding may be more generalizable than previous studies of backcountry and wilderness users might have led us to believe. This study has shown that visitors to tropical reefs and island beaches appear to perceive the influences of others on their experiences in much the same way as do many other water and land-based recreationists.

From a management standpoint, study results do not suggest the need for any immediate management response since they generally confirmed management's opinion that current conditions were acceptable. The relationships found between perceptions of crowding and the various measures of visitor density at the trail and on the beach imply, however, that these variables should be monitored as use levels change in the future.

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OUTDOOR RECREATION

OUTDOOR RECREATION PLANNING

SHOREBIRD AND BOATER IMPACT MANAGEMENT PLANNING

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This paper integrates social and ecological impact data from a barrier beach to demonstrate the value of an inter-disciplinary approach to resource allocation and visitor management. The ecological data included observations of shorebird distributions and causes of human disturbance. The social data were obtained from on-site surveys of boaters and pedestrian visitors. The ecological findings indicated that shorebird habitat preference was limited to two of the four areas where boaters were present. The social data indicated that some boaters engaged in activities that caused shorebird disturbance, and were not ecologically aware of their impacts. A management plan was developed to restrict boaters from areas used by shorebirds. Educational programs were developed to increase boater awareness of the impacts they cause.

Introduction

Stretching along the U.S. Atlantic coast from New England to Florida are a series of sandy islands and beaches. These fragile and dynamic ecosystems, consisting of sand, shell, and gravel, provide a protective barrier along 2,700 miles of shoreline. Wind, tides, and ocean waves constantly move sand and change the size and shape of barrier beaches, as they buffer their wetlands and the mainland from the forces of nature. Coastal barrier habitats include open ocean beaches, broad salt marshes, and dense forests which support a variety of flora and fauna. Salt marshes, for example, are nurseries for many ocean fish which would not exist without the protection afforded by coastal barriers. Migratory shorebirds depend on barrier beaches for feeding, nesting and resting habitat.

Although rich in natural resources, coastal barriers are susceptible to human activity and developmental pressures. Due to their exceptional scenic quality and proximity to large urban centers, barrier beaches along the east coast attract millions of visitors each year. This demand for recreational access has increased the potential for deleterious consequences. Recreation activities can disrupt coastal processes, destroy the ecological integrity of the coastal barriers and reduce the quality of the visitor's experience. In recognition of these potential problems, public concern over protecting these environments has grown dramatically in recent years.

Unfortunately, despite decades of ecological research, the tools for managing coastal barriers remain to be fully developed (Ray and Gregg 1991). This paper examines a program of research and management initiated by The Trustees of Reservations (TTOR) at Crane Beach in Ipswich, Massachusetts. Findings from social and ecological impact studies are used to demonstrate the value of an inter-disciplinary approach to resource allocation and visitor management. The goal was to develop a visitor impact management plan that recognized the existing impact of visitors on shorebirds and made recommendations to mitigate such impact. We begin by briefly reviewing the ecological and social impact literature.

Shorebird Impacts

Information on the effects of recreation on shorebirds is incomplete. Findings are often mixed and the responses to human intruders are divergent, even in a single species (Ream 1980). The impacts of recreation activity can be a direct result of harassment of shorebirds, or can occur indirectly through the loss of habitat, food supply or productivity (Ream 1979, Cairns and McLaren 1980, Haig and Oring 1985, Sidle 1985, Flemming and others 1988).

Direct shorebird harassment includes events which cause excitement and/or stress, disturbance of essential activities, severe exertion, displacement or death. Recreationists engaged in nonconsumptive activities can have a major impact on nesting shorebirds by unknowingly producing stressful situations for the birds (Wilkes 1977, Ream 1979). Piping plovers (*Charadrius melodus*), for example, nest on or just behind the sandy beaches. Because the nests blend in to the sand, plovers are prone to accidental human disturbance. Piping plover chicks are unable to fly for several weeks after hatching, but do leave the nest site with parents and travel along the high tide line in search of food. The chicks blend in well with the sand and are especially vulnerable to Off-Road Vehicles (ORVs). Findings from Cape Poge-Wasque (Swanson 1990) and Coskata-Coatue (Litchfield 1990), two barrier beaches managed by TTOR, indicated that ORVs frequently disturbed nesting sites and altered the behavior patterns of piping plovers.

While ORVs can impact shorebirds directly by destroying nests and possibly killing some birds, the vehicles also affect the birds indirectly by compacting the sand and reducing their food supply (Kuss and others 1990). When the ground flora are lost to trampling, the insects dependent upon the flora also disappear (Speight 1973).

Other research on least terns (Blodget 1978), shows that the shorebirds response to vehicles may be less than that resulting from foot traffic. Controlled experiments using ORVs and pedestrians demonstrated that ORVs had significantly less impact on birds flushing from nests. Vehicles could come twice as close to sitting birds before they would fly than people on foot (Blodget 1978). When the nesting areas were well marked and protected, the birds developed a high tolerance level for ORVs passing close to the nesting areas.

Human disturbance on birds has been shown in some investigations to result in reduced productivity rates and species decline. Disturbing nests causes adults to fly off, leaving eggs vulnerable to hatch failure or predation (Garber 1972, Hunt 1972, Bart 1977). Studies conducted along the Atlantic coast suggest that mammalian and avian predation has severely

limited nesting success and the size of piping plover populations (Cairns 1982, Ailes 1985, Rimmer and Deblinger 1990, Litchfield 1990, Swanson 1990).

Overall, the available empirical evidence highlights the complexity involved in understanding recreational impacts on specific shorebird populations. Among certain species of shorebirds, encounters with even a few humans can alter behavior patterns and influence productivity and survival rates.

Visitor Perceptions of Shorebird Impacts

How visitors perceive impacts on shorebirds is not well documented. Available evidence suggests perceptions of the impact varies among different user groups and different locations. At Cape Poge-Wasque, for example, pedestrian visitors were more likely to recognize the impact of humans on shorebirds than ORV users (Donnelly and Vaske 1989, Deblinger and others 1989). At Coskata-Coatue, ORV visitors were more likely than Cape Poge-Wasque ORV users to think 4-wheel drive vehicles harm the shorebirds (Donnelly and Vaske 1991).

Other comparisons between the pedestrian and ORV users at both Cape Poge-Wasque and Coskata-Coatue show that nearly three quarters of all respondents thought managing for wildlife was more important than managing for other uses. Consistent with this belief, visitors at these two barrier beaches felt a personal obligation to protect the birds, and were willing to reduce the number of their visits to achieve that end (Donnelly and Vaske 1989, 1991).

These observations from two barrier beaches, when combined with data from other natural environments (Lucas 1979; Graefe and others 1984; Kuss and others 1990), suggest three aspects of the impact issue: (1) recognition of the impact, (2) perceived importance of the impact relative to the other attributes of the setting, and (3) evaluation of the impact condition as acceptable or unacceptable . Resource impacts may be recognized or unrecognized by the user (Cole and Benedict 1983). If recognized, the effects may be minimal if the impact is unimportant relative to other setting attributes (e.g., amount of area for sunning), or if the impact is acceptable to users.

In summary, the challenge for barrier beach managers is to develop management plans, based on an understanding of ecological and social relationships, which minimize human impact on shorebirds while providing opportunities for recreation activities (Deblinger and others 1989). The following examines the strategies adopted by TTOR at Crane Beach.

Study Site

Crane Beach is a portion of the 560 ha Richard T. Crane, Jr. Memorial Reservation that also includes a wooded and landscaped drumlin estate. The beach is 6 km in length and is located between the mouths of the Ipswich and Essex rivers. Habitats include fine sand beach, salt marsh, red maple swamp, cranberry bog and pitch pine forest. Crane Beach also provides nesting, feeding and resting habitat for migratory shorebirds.

Numerous species of shorebirds stop over at Crane Beach to rest and feed as they migrate from Canada and the Arctic to southern climes such as the Caribbean and South America. The most abundant species include Sanderlings (*Crocethia alba*), semipalmated plovers (*Charadrius semipalmatus*), semipalmated sandpipers (*Ereunetes pusillus*) and black-bellied plovers (*Squatarola squatarola*). The timing of their arrival at Crane Beach (July, August and September) corresponds to the peak visitor use times.

Crane Beach receives approximately 400,000 visitors per year. Visitors arrive by car at a centralized parking lot or by boat anywhere along the beach except at a lifeguard patrolled swimming area (Deblinger 1991).

Essex End of Crane Beach

Essex End of Crane Beach is used by both boaters and shorebirds. For research purposes, we separated the Essex End into four sub-sections: outer beach, inner beach, steep beach and sand spit. The outer beach is located on the Atlantic Ocean side of Crane Beach, extending 300 m to the north and is adjacent to the sand spit to the south. The outer beach is relatively wide from the low to high tide line with an extensive dune system behind. The sand spit is located at the extreme southern end of the property and is an area that receives daily flooding, the extent of which depends on the tidal cycle. Generally, the sand spit is covered by water during high tide. The steep beach is located to the west of the sand spit and receives its name from the steep incline of the beach below the high tide line. This area provides an excellent natural dock for boats. The steepness of the beach allows a boater to anchor a boat to shore without fear that it will touch bottom as the tide goes out. The inner beach is located on the Essex River side of the property and is composed of a very wide mud flat. In contrast to steep beach, the inner beach slope is gradual, creating a wide mud flat during low tide.

Methods

Both ecological and social research methodologies were used to describe the magnitude of impact and evaluate acceptable mitigation strategies.

Ecological Procedures

Two researchers observed shorebird distributions, abundance and behavior at 30 minute intervals while overlooking the Essex End from a promontory atop a sand dune. Observations were made five days a week including three weekdays and both weekend days, weather permitting, from 3 July to 13 September, 1990. The average duration of observation was six hours. Approximately 200 hours over 41 days were spent observing shorebirds.

Because shorebird distribution and behavior are related to tides (Burger 1981), hours of observation varied according to the tidal cycle. Observations were conducted three hours before and three hours after high tide. Direct counts of shorebirds, people, boats, dogs, TTOR trucks and all terrain vehicles (used by rangers) were recorded before, during and after high tide at each area. The cause and duration of shorebird disturbance were also measured. Disturbance was defined to occur when more than 50% of the birds in a flock took flight.

Social Procedures

A visitor survey was conducted at Crane Beach during the summer of 1990. A total of 174 boaters completed the two-page self-administered questionnaire. Only one member from each boat was interviewed.

The survey contained questions pertaining to the boaters: 1) knowledge of ecological impacts on shorebirds, 2) beliefs about the appropriate number of visitors, and 3) evaluations of current management practices.

Results

Shorebird Ecology and Behavior

A total of 20 species of migratory shorebirds were observed using Crane Beach for feeding and resting. Many of these species, however, were present in low numbers. Only four species reached numbers greater than 100 during any one census period. These four species - semipalmated plovers, black-bellied plovers, semipalmated sandpipers, and sanderlings - are the focus of this paper.

Shorebird distributions varied significantly ($F = 12.06$; $p < .001$) according to location and tide (Fig. 1). On average, however, the shorebirds preferred the tidal flats on the inner beach for feeding (Table 1). As the tide increased, most of the shorebirds on the feeding flats moved above the high tide line to rest along either the outer beach or the sand spit. Sanderlings, the one exception, preferred the outer beach for both feeding and resting. Steep beach, the area with the greatest concentration of boaters, was almost never frequented by the shorebirds for either feeding or resting. These behavior patterns were independent of the presence of boaters. The shorebirds preferred the beaches with the gradual inclines for feeding and resting, while most of the boaters preferred the steep beach with its good anchorage.

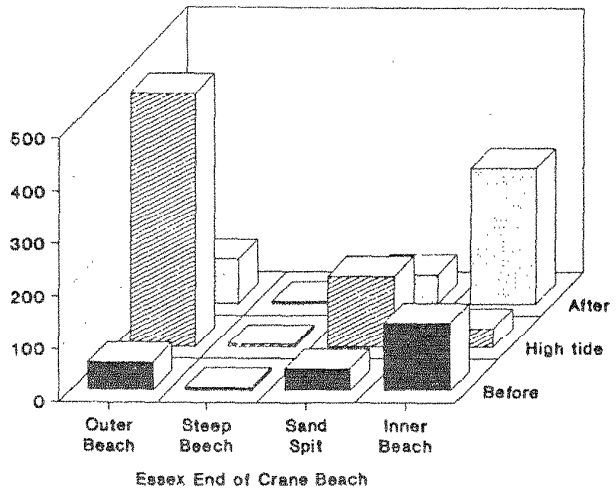

Figure 1. Shorebird distributions.

Table 1. Shorebird and visitor distribution patterns.

Average Number:	Outer Beach	Steep Beach	Sand Spit	Inner Beach
Semi-palmated plovers	81.4	0.8	27.3	77.9
Black-bellied plovers	7.9	0.1	2.3	5.9
Semi-palmated Sandpipers	101.2	3.8	42.5	48.3
Sanderlings	33.4	0.5	9.1	1.7
Boaters	13.9	40.3	13.4	3.0

Human Use

The maximum number of boats observed at one time was 163, with 143 anchored off steep beach. Once visitors anchored their boats, they walked to shore to recreate. Most visitors remained within close proximity of their boat while sunbathing or picnicking. The maximum number of visitors recorded was 461. Of that, 54% occurred at the steep beach, 25% at the outer beach, 19% at the sand spit, and 3% at the inner beach.

Shorebird Disturbance

Shorebird disturbance was defined to occur when more than 50% of the birds in a flock took flight. Determining the cause of disturbance was usually difficult to precisely identify. Of the 627 observed incidences of disturbance, 53% were for unknown reasons, 6% were caused by natural factors such as predators, and 41% were human induced. The largest single cause of disturbance (33%) was pedestrian encroachment into a shorebird area.

The frequency and duration of shorebird disturbance varied greatly. While the frequency of disturbance was related to the number of visitors, duration of disturbance was influenced more by predators than visitors. Of the 294 disturbances with a known cause that were observed throughout the study period, duration ranged from 45.7 seconds for pedestrians to 106.7 seconds for raptors.

Boater Beliefs about Impacts

A number of the survey items addressed the visitors' awareness of the ecological impacts. Nearly 90% of the boaters at Crane Beach recognized that barrier beaches are fragile environments (Table 2). Over three quarters agreed with the general statement that managing for wildlife was more important than managing for other uses. Fewer than half, however, felt that preservation is more important than recreation at Crane Beach.

Table 2. Boaters' beliefs about shorebirds impacts.

Belief	Boaters Agree (%)
Crane Beach is a fragile environment	88
Managing for wildlife is more important than managing for other uses	76
Preservation of natural resources is more important than recreation at Crane Beach	48
More measures should be taken to protect shorebirds	79
Boaters landing at Crane Beach are harmful to the shorebirds	31
I feel a strong personal obligation to protect the shorebirds	92
I would be willing to reduce my visits to Crane if it would help to protect the birds	42

Although three quarters of the boaters believed more measures should be taken to protect shorebirds, less than a third thought they were harmful to the birds. Similarly, while nearly all boaters (92%) felt a strong personal obligation to protect the

shorebirds, only 42% were willing to reduce the number of their visits to help protect the birds.

Other survey items concerned the boaters' beliefs about social considerations (Table 3). Fifty-five percent believed Crane Beach is approaching the limit of the number of *people* the area can tolerate. While nearly three quarters thought the number of *boats* was approaching a tolerance limit, only about a third favored restricting the number of boats permitted to land on the beach. A similar percentage agreed to prohibiting boats from designated swimming areas.

Table 3. Boaters' beliefs about social impacts.

Belief	Boaters Agree (%)
Crane Beach is approaching the limit of the number of:	
people the area can tolerate	55
boats the area can tolerate	71
It would be more desirable if the number of boats were reduced at Crane Beach	36
Boaters should be restricted to designated no swimming areas	38

Visitor Impact Management Planning

The Trustees of Reservations fundamental mission is to preserve for public enjoyment places of exceptional scenic, historic or ecological value throughout Massachusetts. More specifically, the goal is to protect endangered shorebirds and fragile dune systems from the impact of human use, while simultaneously providing opportunities for recreation activities. In light of this objective, the results from the ecological and social research were used to develop a management plan at Crane Beach.

Findings from the shorebird research indicated that predators were causing greater impact than the visitors. Two types of protection were applied to mitigate these impacts. Small wire-mesh fences were installed around nests to protect piping plovers from skunks, raccoons, foxes, gulls and crows. Outside of these exclosures, symbolic fencing composed of a single strand of twine was erected to eliminate disturbance by visitors. These areas were posted with signs to educate visitors about nesting shorebirds.

The Crane Beach shorebird disturbance study indicated a natural zoning existed between visitors and the birds. Most boaters were attracted to a portion of the beach which, due to habitat considerations, the birds did not use for either feeding or resting. By designating restricted boat landing areas outside of the feeding flats and restricting visitors from bird resting areas in dunes, migratory shorebirds could stop over at Crane Beach undisturbed.

The social research indicated that the beliefs held by some of the visitor groups conflicted with the management goals. Comparisons of questionnaire responses between the boaters and another survey of pedestrians at Crane Beach (Deblinger 1991), for example, revealed a clear distinction. Boaters were less educated about property regulations and human impact. At Crane Beach, pedestrian visitors enter via a gatehouse where they receive educational information. Conversely, boaters land at many sites along the beach where educational information is unavailable. The management plan designated boat landing areas where boaters would receive educational information, be segregated from swimmers to promote safe recreation, and be segregated from wildlife and dunes.

The social research results also indicated that a majority of the visitors felt that Crane Beach was approaching its tolerance limits for both boats and people. In response to these findings, designated boat landing areas were specified to segregate the boaters from the swimmers. While current use levels do not necessarily warrant restricting visitor numbers at this time, future research and planning will monitor shifts in these baseline data.

Discussion

Early in the study, it became apparent that the majority of shorebirds were using Crane Beach for a resting area during high tide. Moreover, the tidal cycle explained shorebird distribution and behavior patterns. Shorebirds were located on the feeding flats (shallow sloped beaches) below the high tide line before and after high tide. During high tide, they shifted distribution to the sand dunes above the high tide line along the outer beach. The steep beach used by boaters for safe anchorage was not used by shorebirds. A natural spatial separation, therefore, segregated the visitors from birds. The management plan reinforced this natural zoning by designating a boater landing area, consistent with the location used by most boaters.

As for frequency and duration of disturbance, fencing and signage were used to restrict onshore visitors' activities to an area beyond the flushing distance from shorebirds. Offshore boater activities did not disturb resting or feeding shorebirds.

Boaters that landed at Crane Beach were less aware of the fragility of barrier beaches and their natural inhabitants than visitors that accessed the property through the parking lot entrance. The visitor impact management plan established education programs to increase the boaters awareness of the impacts they can create.

Although ecologists continue to search for solutions to protect fragile dune environments and increase endangered shorebird populations, it is apparent that information regarding visitor attitudes must be combined with ecological data. At a time when the public's thirst for barrier beaches as recreational sites or locations for summer houses seems unquenchable, management strategies, such as beach closure, that do not include visitor attitude information may be deleterious to barrier beach environments in the long run. Conversely, the combination of visitor education and management techniques that balance preservation with recreation can result in a situation where the environment can be protected from recreationists and predators, and the visiting public can still enjoy the area.

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VERMONT LAKES AND PONDS:

A PILOT RECREATION PLANNING PROCESS

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This report analyzes a pilot planning study conducted on two Vermont ponds by University of Vermont outdoor recreation planning students. It discusses the planning process used for these ponds and offers ways in which a statewide lake and pond planning process could be implemented.

Introduction

Vermont is known as the Green Mountain state. It has a unique combination of mountains, valleys, farmlands, forests, lakes, and ponds. These natural resources have made Vermont a popular attraction for residents and visitors alike. Population growth and economic development have caused a growing concern for many of these resources. Can Vermont allow growth and development to occur and still adequately protect its natural environment?

Land use change occurring around many of Vermont's waterbodies has resulted in the official concern of the Vermont State Legislature and other officials (VSA 1985). Vermont has approximately 600 lakes and ponds over 5 acres. These waterbodies, their shorelines, and watersheds are used for several purposes. Recreation, commercial, and potable water supply, sewage treatment, and fish and wildlife management areas compete for space and resources. The demands placed on Vermont's lakes and ponds will undoubtedly increase in the future. For both economic and environmental quality reasons, the state cannot allow the quality of its lakes and ponds to decline.

The 1988 Vermont Recreation Plan and the Lakes and Ponds Task Group Report identified six issues related to lake and pond management. Water quality, aesthetics, boating, public access, remote ponds, and fish and wildlife resources were identified as problems. Improved public access can create boating and other recreation conflicts. Lakeshore development can impact scenic values, water quality, and fish and wildlife. Trying to protect the quality of Vermont's lakes and ponds and manage their various uses is a complex task, but warranting concerted effort.

In an attempt to protect these resources, the Vermont Legislature has directed the Vermont Agency of Natural Resources to prepare a lake and pond management plan for each of the 288 waterbodies in the state over 20 acres. The Agency has begun to collect information on these waterbodies and formulate management strategies for their protection. The first step in the process is the development of a lake and pond planning method. This process identifies problems, resources and alternative solutions that can be used to manage these diverse areas effectively over the long term.

Pilot Planning Study

The State Department of Forests, Parks and Recreation decided to utilize the efforts of an upper division outdoor recreation planning class taught in the University of Vermont's School of Natural Resources to develop techniques that could be used in a statewide lake and pond planning effort.

Study Areas

Colchester Pond and Indian Brook Reservoir, Chittenden County, Vermont are, man-made waterbodies that were originally developed as water supply reservoirs, were selected for the study. They are located in adjacent watersheds 10 miles from Burlington, Vermont. Both areas are experiencing growth pressures because of their proximity to the Burlington urban area. They have a variety of land uses including villages, suburban development, and rural residential, agricultural and forested lands.

Organizaing the Planning Teams

The natural resource students were divided into two planning teams, one assigned to each waterbody. They had the task of preparing an Environmental Assessment and a General Management Plan, to include alternatives for the protection and recreation use of each waterbody. The students selected planning coordinators and the course instructor and graduate student served as advisors.

Schedule of Planning Tasks

The planning process was divided into the following ten major steps:

1. Familiarization with the project sites. Meetings with state and local agency representatives.
2. Organization of the planning teams. Identification of data sources and development of cartographical information.
3. Development of an environmental assessment which involved obtaining natural, cultural, and socioeconomic information.
4. Identifying jurisdictions, applicable rules and regulations, law enforcement issues, land use regulations and responsible public agencies.
5. Collecting information on recreation use.
6. Administering a public opinion survey.
7. Analyzing all information and issues.
8. Developing a set of alternatives.
9. Selecting the preferred alternative.
10. Preparing and presenting the final plan.

Study Area Characteristics

The two watersheds contain just over 2,000 acres. There is minimal development along the shorelines of each pond. The Colchester Pond shoreline and watershed is privately owned by seven different property owners. Indian Brook Reservoir shoreline is entirely in public ownership. The Town of Essex purchased a 574 acre parcel surrounding the shoreline in 1986 from a private developer for $435,000. Both watersheds are predominantly forested and contain large residential lots, agricultural and private forest lands. The existing forest cover is a typical mix of northern hardwoods and coniferous species for this region of Vermont. Indian Brook Reservoir is used for public recreation. Public access to Colchester Pond is restricted because of the private lands surrounding the shoreline. From a regional planning perspective, these watersheds are the remaining large open space areas in the Towns of Colchester and Essex.

The Winooski Valley Park District is currently negotiating with private landowners in an attempt to obtain land for public use. A network of informal trails is found throughout both watersheds. They are used for hiking, running, mountain biking, cross country skiing, and for fishing and hunting access.

What was Accomplished

The Pilot Study resulted in the preparation of an Environmental Assessment and a General Management Plan for both the Colchester Pond and the Indian Brook Reservoir. The student planning teams collected information on these areas that did not previously exist. They developed reasonable alternatives for each watershed and selected a preferred alternative that they determined would best protect the natural resources in the area.

The environmental assessment phase of the pilot study was perhaps the strongest and most useful part of the project. Much information on the natural and cultural resources in each watershed was collected, analyzed and presented as new information.

The public survey effort was limited due to time constraints. The students did conduct a phone survey of area residents and obtained some valuable information. They also conducted interviews with key town and state officials which helped to identify issues considered in the planning and management recommendations.

The students presented a range of alternatives for each watershed ranging from no action to various levels of recreation management and development. These alternatives were preliminary and would be more intensely developed after public meetings and input into their objectives. The planning teams' preferred alternative represented reasonable management solutions based on the results of the environmental assessment process. The option of developing a plan for managing both watersheds as one management unit was discussed.

A Regional Alternative

Colchester Pond and Indian Brook Reservoir watersheds can easily be thought of as one management unit. Both shorelines are undeveloped and their combined watersheds are just over 2,000 acres. There are 30 private property owners involved. Most of the parcels are relatively large and are zoned for either conservation or agricultural use. The Indian Brook watershed is approximately 95% forested and Colchester Pond is about 65% forested. The Town of Essex owns 574 acres in the Indian Brook watershed, including the entire shoreline of the reservoir. The shoreline of Colchester Pond is entirely private. The Winooski Valley Park District is currently seeking easement and ownership rights to provide public access to the water. It seems logical that it may be prudent to develop a single management plan for both watersheds. This plan could allow for quality recreation suitable for the local environments and protect them from overuse. In addition, property rights of the private landowners could be carefully protected.

A combination of easements, development restrictions, land swaps and land acquisition techniques holds potential, but is time consuming and complex. The information presented in this Planning Study can be a useful guideline. A set of regional park development alternatives could be formulated after consultation with the state, towns, private landowners, and Winooski Valley Park District.

The combined watersheds of Colchester Pond and Indian Brook Reservoir offer unique opportunities for significant open space protection and outdoor recreation in a primarily urban region. As the Champlain Valley area continues to grow, these areas will become increasingly valuable as natural recreation areas.

Developing a Lake and Pond Planning Model

The secondary purpose of this study was to recommend ways in which a Statewide Lake and Pond Planning Process could be implemented and Colchester Pond and Indian Brook Reservoir serve as appropriate case studies.

Because of the diversity of types and location of lakes and ponds in Vermont, it is difficult to develop a planning process that will fit all situations. The case study ponds were relatively small and undeveloped. They are man-made reservoirs and are currently used for only limited amounts of recreation. Many other Vermont lakes and ponds are larger, have heavily developed shorelines, and a variety of conflicting recreational uses. They pose greater planning and management challenges.

Still other lakes and ponds are even more remote and have a wilderness or primitive characteristic to them. These areas are increasingly rare and the plans and management actions that are carried out on them will, in many cases, have irreversible impacts.

Common Elements of a Lake and Pond Planning Process

While each lake and pond area is unique, there are common elements in a planning process which could be utilized on all lakes and ponds. A list of these elements is given below:

1. Designation of the Planning Team
2. Appointment of an Advisory Body
3. Development of Planning Goals and Objectives
4. Planning Process Organization and Schedule
5. Environmental Assessment and Resource Based Inventory
6. Public Involvement Procedures and Guidelines
7. Development of Management Alternatives
8. Selection of the Preferred Alternative
9. Plan Implementation
10. Plan Evaluation

The elements listed above are not unique to Lake and Pond Planning. They are usually found in any local land use plan. Lakes and ponds, however, are unique resources. They combine land and water resources that are used for private and public recreation, water supplies, and wildlife habitat. There may be a very diverse group of interested publics. The two most important elements may be the environmental assessment and the public involvement procedures.

The Environmental Assessment

This part of a lake and pond planning process must find, collect, organize, analyze, and present a variety of information in a format that can be easily understood. This includes information on geology, soils, climate, topography, forest and plant species, water quality indicators, and wildlife species and their habitats. It also includes land use data, demographic and socioeconomic information, and recreation use statistics.

Although a general outline of the basic types of environmental assessment information can be developed, the availability and usefulness of the information will vary. The information should be accurate and up-to-date, relevant, and useful. Without good information, any planning process will be inadequate. It is critical that the lake planning process collect and utilize the best information available from a variety of sources to make certain that planners and the public have the resources to

develop viable alternatives for planning, management, and protection of these resources.

The Public Involvement Process

After the environmental assessment phase, implementing a comprehensive public involvement process may be the most difficult, time consuming and costly part of the lake planning process. Over the last decade, public involvement has evolved from a purely information function toward an interactive function. Planners must be comfortable with the process and help create a sense of openness and trust in the process on the part of the public.

The decisions that affect public resources must be presented and discussed in a public forum. Developing public review and involvement procedures as part of a lake and pond planning process will help ensure that all segments of society have an opportunity to participate and that all views on how to protect and manage these resources will be heard.

Recommendations for Implementing a Vermont Lake and Pond Planning Process

Listed below are the twelve recommendations developed as part of this report. Some of these have already been implemented. They represent the opinions of the authors and can serve as one point in which to further develop a workable Vermont lake and pond planning process.

1. Designate a State Lake and Pond Planning Unit within the Vermont Agency of Natural Resources. This unit would be responsible for:

    a. collecting information on lake and pond resources from a variety of areas and sources,
    b. developing a statewide classification system for lakes and ponds that will be appropriate for implementing a lake planning process,
    c. working with local governments and other agencies and organizations to identify local and state lake and pond planning issues,
    d. coordinating the statewide lake and pond planning effort and acting as mediator if disputes over jurisdiction or other issues arise,
    e. developing a set of guidelines for obtaining environmental assessment information necessary for conducting lake and pond planning studies,
    f. developing slide and videotape programs and brochures useful in explaining the current situation on lakes and ponds and the importance of the planning process, and
    g. developing a list of key contact agencies, organizations and persons that should be involved in the process or who can supply information on lake and pond issues and resources.

2. Define three types of planning boundaries that can be used in preparing lake and pond management plans:

    a. Watershed Boundary - using topographic maps.
    b. Lakeshore Impact Area - can be defined for each lake as appropriate.
    c. Overall Planning Area - would include a designated zone outside the watershed area that has a potential impact on lake resources. This would have to be determined for each lake and pond area. Roads, town lines, or other features could be used as appropriate.

3. Utilize regional planning techniques and greenline park concepts engaged in lake planning projects. This would promote the idea of lakes and ponds as being regional resources and examine ways to designate regional open space areas and greenway recreation corridors.

4. Appoint a statewide lake and pond advisory committee. This committee would be comprised of 20-30 members who would assist the State Lake and Pond Planning Unit in promoting and implementing the lake and pond planning process. Each member should have a particular area of expertise and should be able to act as a liaison to a specific agency or organization to obtain information for the State Lake and Pond Planning Unit, or local planning team as requested.

5. Develop a set of guidelines for lake and pond planning projects which could be used by federal and state agencies, local governments, and other organizations which may be engaged in lake and pond planning studies.

6. Make developing management plans for wilderness type lakes and ponds a high priority. Wilderness ponds should be identified and should have established management and protection plans and regulations enacted to protect their resources as quickly as possible. Wilderness resource values can be very easily altered by even small intrusions and unplanned developments.

7. The State Agency of Natural Resources should work with other organizations, such as colleges and environmental and sportsman's groups, and lake associations, to conduct periodic surveys on statewide and local lake and pond issues and problems.

8. Some guidelines for the lead agency in lake and pond planning efforts should be established.

9. The State Agency of Natural Resources should report on the status of lake and pond resources on a regular basis.

10. Public involvement in the lake and pond planning process should be a high priority and guidelines for implementing public involvement should be established.

11. The Public Trust concept, as it relates to lakes and ponds in Vermont, should be further clarified. This will be a major issue to consider in the lake and pond planning and management process.

12. In the effort to protect Vermont's "inland" lakes and ponds, Lake Champlain and Lake Memphremagog must not be overlooked. The complexities of land use, recreation, pollution, environmental impact, and overlapping political and governmental jurisdictions make these large lake areas a major challenge. The value of these lakes is immeasurable to two countries, three states, the northeast region, and many local towns and counties. These resources cannot be allowed to become international sewage systems for regional growth and development. The importance of the Lake Champlain Basin is evident internationally, since it has recently been designated a World Biosphere Reserve.

Summary

Vermont has been a national leader in implementing environmental laws and planning programs. Acts 250 and 200 are examples of this leadership. They were not processes that were easily enacted or implemented, yet they are attempts to look ahead, anticipate changes, and plan for the future.

Vermonters have indicated that they want to protect their way of life, their towns, their history, and their environment.

The lake and pond planning process is just getting underway in Vermont. The implementation of a viable lake planning and management process will be the result of public involvement, up-to-date information, leadership, and cooperation between various levels of government, interest groups and individual citizens that are concerned with the future management and protection of lakes and ponds in Vermont. The lake and pond planning process will be a real test of the regional planning process and Act 200, the statewide planning program.

Aldo Leopold advocated the idea of a "land ethic." Vermont is attempting to develop a lake and pond ethic by trying to implement a process to plan and manage these resources widely over the long term. Because of the number and diversity of the lakes and ponds in Vermont, it is an awesome task. The people of Vermont should be commended for their effort and will be rewarded when these resources are used widely and preserved for the future.

Recreation is but one use of lake and pond resources. Managing recreation use in and around land and water areas and also attempting to protect natural resources is a very complex task. Attempts are made to strike a balance between use and protection. There are rarely easy answers and almost always an abundance of controversy. The idea of Visitor Impact Management is emerging with some new ideas and concepts.

We can say over and over that lakes and ponds are pristine, fragile, and irreplaceable, but that idea is one that is hard to grasp. We become numb to these descriptions and adjectives. It is a simple fact that lakes and ponds cannot be produced on demand like cars and clothes and houses. What we have now is all that we are going to get. Natural resource managers have the responsibility of making the decisions on how to best manage these resources. If they are to be protected for the future, a lake and pond planning process must be implemented.

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ENVIRONMENTAL GLASNOST:

PROTECTING A RESOURCE YOU DO NOT OWN

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The Upper Delaware River management plan offers an alternative to outright purchase and subsequent management of natural recreation areas. Advantages include providing for appropriate growth, pooling agency manpower and funding, and making the private sector more responsive to finding solutions to resource issues.

I am very pleased to be here and sincerely appreciate the opportunity to speak about what it means to protect natural resources without federal land ownership. For the past ten years, I have been deeply involved in a new and very controversial approach to land management for governmental agencies...one which requires a personal dedication to convincing those who own the land that it is in the best interest of both the public and private sectors to work together to prevent resource degradation without substantial federal control through land acquisition.

The conflict between land acquisition for public use and private property rights has been around for a long time. Prior to World War II, federal land acquisition in the western half of the country was less impacting on private land ownership because most of the newly established parks came out of lands already publicly owned.

Demand for nationally managed public recreation areas in the eastern half of the United States is best illustrated by the development of Shenandoah National Park in Virginia (better known as the Skyline Drive), and the Blue Ridge Parkway, which stretches from northern Virginia over 460 miles to the Great Smoky Mountains National Park in North Carolina. Both areas were conceived and built in the late 1930s. Each was set up to provide open space to meet recreational needs for a growing mobile urban population.

One of the lesser known bits of history related to the development of these two park units was the fact that virtually thousands of rural families, who had lived in these picturesque Blue Ridge Mountains for generations, were bought out and resettled in the valleys, whether they wanted to move or not. Family land and ancestral history meant more to many of those folks than any price the government offered, but the greater need for public recreational opportunities prevailed.

Until very recently, land acquisition for National Park Service areas and other federal agencies was based on a policy that outright ownership by the federal government was the method of choice to preserve, or conserve, the best of America's natural resources. Each area had a well delineated boundary, federal law enforcement jurisdiction and a ton of written guidelines for every conceivable resource or administrative issue.

Until the late 1950s, land acquisition for public use did not create a very large or well organized outcry from private land holders. During the sixties, many national recreation areas were authorized by Congress to provide open space for public use within reasonable distances of major metropolitan areas. Each new area caused a louder and louder controversy over the taking of private land from either willing sellers or acquisition through condemnation procedures from unwilling sellers.

Places like Assateague Island National Seashore, Fire Island National Seashore, and the Delaware Water Gap National Recreation Area were established only after thousands of small landholders, who dearly loved their rural hideaways, were bought out. Buying out all private land ownership within a defined boundary got tougher and tougher because of the costs, and due to organized and very vocal resistance against the loss of home and home rule. Various incentive methods were offered to land owners, such as life tenure and ten to twenty-five year continued use options, but for those who did not want to sell, there was no acceptable method of compensation for their loss.

Long before Congress created the National Wild and Scenic Rivers Act in 1968, urban dwellers, on a nationwide basis, had been carving up prime river edge land into quarter-acre plots with cheap summer homes. They often used converted school buses or built shacks becuase good land management practices, like zoning, did not exist. This quest for a summer place in the country during the sixties somehow passed right by the Upper Delaware River Valley. Recreation boating activity was minimal, so land in the river valley remained in large parcels.

During the seventies, recreational boating along the upper Delaware River with canoes and rafts increased dramatically. This section of the Delaware River is no more than a three-hour drive from twenty-five million people, which has caused our visitor use statistics to jump from approximately 100,000 in 1980 to over 225,000 for 1990. Most want to come for the day to rent canoes or rafts or just spend the day enjoying a drive along the river. However, subdivision signs shot up along major roads in the mid-1980s and the race was on to own a piece of land near the Delaware River. Seasonal home development has not been as great in the upper Delaware as further downstream, but it is increasing and we are trying to prepare the local communities to plan effectively for it.

The upper Delaware River legislation is designed to protect both public use rights on the Delaware River and private land rights adjacent to the river. It involves a management structure that requires a maximum of public involvement and a minimumof direct federal control. There is heavy reliance on the use of citizens' advisory groups, the local political structure and existing agency jurisdictions to mitigate resource issues affecting the river.

To demonstrate how the upper Delaware management approach differs from traditional methods and why many federal managers might balk at accepting this approach, I would like you to imagine yourself in the following situation.

You are a twenty-year veteran in the National Park Service, having worked primarily in traditional land -based parks. You have just received a vacancy announcement for the position of Superintendent at the Upper Delaware Scenic and Recreation River which states:

The incumbent will be responsible for recreational use management and resource protection along a 73.4-mile stretch of the upper Delaware River basin. Congressional legislation for the area has identified approximately 56,000 acres of land as a federal area of interest for developing and maintaining land management practices that will sustain the high water quality in the Delaware River for public recreation and as a water supply for millions. Resource impacts may involve the jurisdiction of up to nine federal agencies, environmental law for two states and local zoning in fifteen communities along the river edge.

The following management guidelines have been established for the area:

A. *Lands actually owned by the federal government are currently 15.2 acres that have been purchased over the past ten years. Land acquisition is very limited and acquired primarily for administrative offices. The area's river management plan calls for land acquisition to not exceed 130 acres corridor-wide.*
B. *All land will only be purchased with the consent of the local government where the land is situated and approved by a local "council" which represents all local, state, and federal management interests in the river corridor. All land acquisition will be on a willing buyer, willing seller basis.*
C. *Condemnation authority, although provided in the enabling legislation, will only be used if a significant resource threat exists which cannot be mitigated or resolved by existing legal authority.*
D. *Agency jurisdiction will be restricted to the surface of the river, and the acreage actually owned by the agency. All river access points managed by the National Park Service are leased from existing state agencies.*
E. *The incumbent will have full responsibility for public use and safety concerns for a park where public visitation exceeded 200,000 in 1990. Over 30% of the canoe safety patrols are carried out by volunteers from local canoe clubs.*
F. *The incumbent will present agency objectives as a non-voting advisor to a local council made up of volunteer representatives from the fifteen towns or townships that border the river. The council also has a representative from the states of Pennsyvania and New York, and a representative from an interstate compact concerned with water quality and quantity over the entire Delaware River basin.*
G. *Every effort will be made to encourage local communities to zone in such a manner so as to be compatible with the intent of a set of land management guidelines established by consensus among all parties to the "council" These guidelines are not legally binding.*
H. *All development by the NPS unit will conform to local zoning, and projects taken on by the unit will be reviewed for approval by the municipality where the development occurs.*
I. *All land-based law enforcement, emergency rescue response, and trash removal (related to public use on the river) will be subsidized through contracts to local jurisdictions.*

The upper Delaware management approach stimulates communication between governmental factions that have not been really talking with each other for a long time. Local politicians can now find just who is supposed to deal with their problem and they know how to apply pressure to be heard by a very thinly spread state resource protection organization. Each landowner, local supervisor, county executive, agency bureau head, and agency director has been identified and educated to the concept.

Will this approach work? Well, if your management objectives are to stop development, totally protect the wildlife habitat, and keep the area in a totally natural state, the answer is, "probably not."

On the other hand, if your objective is to allow for well planned appropriate growth, to pool agency manpower and funding in order to monitor or prevent resource threats from new dams, mining, landfills, toxic spills, soil erosion, etc., and make the private sector more responsive to finding solutions to resource issues, then this concept is definitely working.

There will be lost open space, but with good planning, the impact will be far less than without this approach. With hard work and good communication, we will prevent major pollution to the federal area of interest and influence the prevention of pollution for the entire upper Delaware water shed.

This approach reaches out to all of those affected by a public project. It provides the opportunity for each citizen to understand the environmental impacts that are affecting their community and the delicate balance between economic development and maintaining open space to keep the natural processes functional. It offers land owners a real chance to help manage the public use generated by a scenic river designation rather than just cussing out the federal government for "bringing all those noisy city folk to their peaceful valley."

The fear over federal condemnation ran rampant during the planning stages for this concept. It is still there to some degree because of past and existing governmental land acquisition policies. During the intense public debate there was a recurrent theme from those landowners who could be affected by this approach. "This is my land and I will do whatever I want with it or to it."

Unfortunately, the world is too small and the environmental problems too complex to assume that land ownership carries no responsibility toward the world's environmental problems. We also can no longer lay the total burden of preventing environmental degradation on public officials and government agencies. Today, the cry should be, "This is my land but I must work to preserve its natural values in order to protect the world's environment for the survival of future generations."

Protecting the upper Delaware River Valley is now the responsibility of a labyrinth of governmental entities, every private landowner, and those who come to use the resource. Minimizing human impacts on the environment starts when each individual becomes concerned about their own impact. That responsibility cannot be delegated because the future of mankind depends on our ability to manage our environment which is a resource that we do not own.

LAKES AND PONDS RECREATION MANAGEMENT: A STATE-WIDE APPLICATION OF THE VISITOR IMPACT MANAGEMENT PROCESS

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The Visitor Impact Management (VIM) process is designed to identify unacceptable changes occurring as a result of visitor use and to develop management strategies to keep visitor impacts within acceptable levels. All previous attempts to apply the VIM planning framework have concentrated on specific resources. This paper expands this focus to an entire state. Based on the Vermont Lakes and Ponds Recreation Management study, the VIM process can be applied regionally. Differences between site specific and state-wide applications are noted.

A large body of literature demonstrates that environmental and recreational quality are multi-faceted concepts that can be threatened by a number of interrelated types of impacts (Kuss and others 1990). The amount, type and location of use, for example, influences use/impact relationships in complex, and often non linear ways. Some types of recreation create impacts faster or to a greater degree than other types of activities. Even within a given activity, impacts can vary according to the type of transportation or equipment used, and the visitors' characteristics (e.g., party size or behavior). Because environments and user groups have different tolerance limits for human disturbance, the extent and severity of impact varies widely. Moreover, given a basic tolerance level, the outcome of recreation use may still depend on the time and place of human intrusion.

In an attempt to summarize this knowledge for managers, planning frameworks have emerged that integrate the scientific data within the judgmental process of balancing values related to preservation and use (Stankey and others 1985, Shelby and Heberlein 1986, Graefe and others 1990).[1] The Visitor Impact Management (VIM) process (Graefe and others 1990), for example, is based on the premise that effective management involves more than setting carrying capacities and use limits. While use quotas represent one possible strategy for reducing the impacts of visitors, it is important to remember the lessons from previous studies that found only weak or indirect relationships between impacts and overall use levels (Hendee and others 1978, Manning 1986, Kuss and others 1990). In such instances, establishing capacities and limits may do little to reduce the impact problems they were intended to solve, whereas other potential management strategies may be quite effective for reducing the impact conditions.

Previous applications of the VIM planning framework have examined the model's utility in two national parks (Great Smoky Mountains National Park, Glacier National Park), a national monument (Buck Island Reef National Monument), an Army Corps of Engineers Reservoir (Raystown Lake), a barrier beach owned and managed by The Trustees of Reservations (Cape Poge Wildlife Refuge and Wasque Reservation), and a state wild and scenic river (Youghiogheny River). These site specific applications suggested that the VIM process offers a logical approach for managers concerned with ameliorating the impacts caused by recreational use. This paper applies the VIM process to the management of lakes and ponds in Vermont. *By broadening the focus to an entire state, the goal is to identify issues that should be addressed when VIM is applied to multiple locations in a region as opposed to a single resource.* We begin by briefly reviewing the VIM process.

The Visitor Impact Management Process

The VIM framework includes an eight-step sequential process for assessing and managing visitor impacts. The first five steps in the process are devoted to the important, yet often slighted, task of problem identification. While this may appear to be a simple matter, it has often proved to be a stumbling block to effective resource management and related investigations. In state-wide planning efforts, characterized by a diversity of environments and experience opportunities, the importance of these considerations becomes even more crucial. Consequently, the problem identification issue is separated into several steps to isolate the various decisions that must be made in assessing existing conditions. The steps in the VIM process are listed below:

1) Preassessment Data Base Review
2) Review of Management Objectives
3) Selection of Key Impact Indicators
4) Selection of Standards for Key Impact Indicators
5) Comparison of Standards and Existing Conditions
6) Identification of Probable Causes of Impacts
7) Identification of Management Strategies
8) Implementation

These steps are designed to facilitate dealing with three basic issues inherent to impact management: (1) the identification of problem conditions (or unacceptable visitor impacts); (2) the determination of potential causal factors affecting the occurrence and severity of unacceptable impacts; and (3) the selection of potential management strategies for ameliorating the unacceptable conditions.

Applying the VIM Process

There are 295 lakes and ponds, 20 acres or larger in Vermont. Ninety-six of the lakes are at least 100 acres in size. This diversity offers numerous water-based recreation opportunities. Fishing, swimming, boating, camping and a host of other

1/ In addition to the Visitor Impact Management process discussed here, other planning frameworks include: the Limits of Acceptable Change (Stankey and others 1985) and the Carrying Capacity Assessment Process (Shelby and Heberlein 1986).

activities are engaged in by hundreds of thousands of Vermonters and visitors to the state (Bevins and others 1987).

The provision of such opportunities occurs on many governmental levels. Federal agencies, such as the U.S. Forest Service, the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers administer lands adjacent to lakes and oversee water impoundments, on which water-oriented recreation activity occurs. On the state level, approximately 200 fishing access areas are maintained by the Department of Fish and Wildlife. The Department of Forests, Parks and Recreation also administers recreation areas on lakes and ponds. Municipalities and towns provide swimming beaches, boat access areas, docks, and fishing facilities available to the general public. When VIM is applied on a state-wide or regional level, this diversity of management authority must be recognized and dealt with specifically, if the process is to be effective.

Increased participation in water-based recreation activities, coupled with unequal dispersion of lakes and ponds within the state, have led to user conflicts, crowding at existing public access points, loss of diversity of recreation opportunities, and private land closure in some locations. Increased developmental pressure has likewise threatened the ecological integrity of the few undeveloped ponds left in Vermont.

As a result of these identified concerns and needs, a Lakes and Ponds Recreation Management study was initiated by the Vermont Department of Forests, Parks and Recreation. The VIM process was selected to assess visitor impacts and to provide recommendations for implementing management and protection strategies. Because each lake and pond in the state can be characterized according to the setting's unique physical features, the presence or absence of specific recreational activities and amenities, and by the desired management objectives for that resource, the eight steps in the VIM process need to be conducted for each lake and pond separately. At the same time, commonalities among lakes can be identified in the process. When viewed in a regional context, therefore, a system for categorizing lakes and ponds with common management objectives, impact indicators and standards is required. The discussion to follow outlines general data collection requirements and decision points that were and should be used in these evaluations.

Step 1: Preassessment Data Base Review

The objective of Step 1 is to identify and summarize what is already known about the area(s) in question so that existing information can be put to its best use as the process continues. During the preassessment data base review for Vermont, it was necessary to delineate the physical area(s) to be included throughout the visitor impact management process. For convenience, management areas were patterned after the 12 planning regions in the state.

Two types of data were relevant for Step 1. The first involved an inventory of the physical features associated with each lake, while the second cataloged the recreational activities and amenities. The physical feature inventory included information regarding the area surrounding the lake, as well as data on the characteristics of the lake itself. The former provided an indication of the types of indirect impacts that may be occurring, while the latter described the existing conditions and suggested variables which may increase or decrease the direct impacts associated with human activity. Examples of variables measured in the physical feature inventory are listed below:

Physical Feature Inventory Data:

- Lake surface area
- Shoreline configuration
- Water level fluctuation
- Lake bottom sediment type
- Critical/unique habitats
- Types of aquatic plants
- Shoreland ownership patterns
- Development of the lakeshore
- Type of road/trail access
- Lake surface area used for recreation
- Shoreline length
- Shallowness ratio
- Water clarity
- Phosphorus levels
- Specific biota
- Shoreline vegetation
- Watershed uses
- Homes around lake
- Distance to nearest road
- Scenic/aesthetic qualities

Data on some of these variables existed in data bases maintained by the state. Information for the other variables was and continues to be gathered. While gaps in these data bases were inevitable, the intent of the physical feature inventory was to determine what is currently known about each lake, and to identify where additional data about the setting should be gathered.

The data base review also identified the need for an inventory of the current recreational use of the water, estimating the range and percentage of type of use occurring, determining how much of the use was attributable to day users (e.g., boating use from designated launch areas versus use by shoreline owners), and estimating peak use (i.e., the maximum recreation use at any one time). The estimate of the range and percent of use of activities occurring on a lake will be accomplished through on-site counts, or through volunteer monitoring of the recreational use of the lake. Counts and activity use percentages will be taken at random times over the primary recreation season to ensure a more representative sample. Estimates of the percentage of boating use attributed to day users will be determined through on-site observations of day user launches. Similar methods may be used to determine day use shoreline fishing, day use picnicking, and swimming. The following delineates examples of suggested criteria for the recreation inventory.

Recreation Activity / Amenity Inventory Data:

Management
- Management authority for the lake (public vs private)
- Existing management objectives
- Type and presence/absence of lake zoning practices
- Prevalence of law enforcement
- Existing use restrictions

Facilities
- Location and number of boat launching areas
- Location and number of marinas, moorings and docks
- Location and number of camping / picnic areas
- Location and number of designated swimming areas

Activities
- Range / mix of recreation activities
- Current usage patterns
- User satisfaction / crowding / user conflicts
- Type of experiences provided / desired

Of the two types of inventory data (physical feature and recreation activity / amenity), the state had a more complete understanding of the physical feature data. To apply the VIM process on either a site-specific or regional basis, however, both types of information and the interaction between the setting and social attributes are important. Recreational

activities, for example, affect and are effected by water quality factors such as clarity, pH, temperature, macrophyte coverage, and plankton abundance.

Step 2: Review of Management Objectives

The second step in the process is to review management objectives pertinent to the situation. In recent years, authors have emphasized the importance of clear and specific management objectives (Hendee and others 1978, Shelby and Heberlein 1986). To be effective, management objectives need to define the type of experience to be provided in terms of appropriate ecological and social conditions (Stankey 1980, Graefe and others 1990).

Early in the study, it became apparent that the management objectives for Vermont's lakes and ponds were not clearly delineated. A classification scheme was developed to help managers set objectives for acceptable recreational uses and impacts. In general, some lakes could be characterized as high density recreational experiences where motorized watercraft are common, while others provided low density wilderness opportunities with no motorized use. While no single set of objectives existed for all areas, the VIM process allowed different sets of objectives to be established for broad categories of lakes and ponds throughout the state.

Based on the manager interviews conducted as part of the project, four initial categories were identified: 1) solitude and/or wilderness, 2) non-motorized recreational, 3) low-speed motorized use and compatible non-motorized recreation, and 4) lakes or ponds managed for high-speed use and compatible low-speed uses. This array provided a range of environments in which alternative experiences and activities could occur.

The process of setting objectives was further facilitated by categorizing each of the initial classifications according to the amount of use found on the lake. Low, medium, and high use occurred within each of the four classifications.[2] The state operationally defined boundaries of what constituted low versus medium versus high use within each experience classification. Little Averill Pond, for example, was classified as high-speed use because water-skiing is permitted, but because the magnitude of use was low, the pond was categorized as a high-speed, low use resource. Lake Paran, on the other hand, had a high level of use on the peak swimming days of summer even though motorized watercraft were prohibited. This lake was classified as a non-motorized, high use lake. All lakes and ponds in Vermont over 20 acres in size were classified in a similar manner.

Although judgments regarding the initial four categories and the amount of existing use were somewhat subjective, the classification process was enhanced by incorporating other lake characteristics into the formation of management objectives. Remoteness, range and mix of recreation use, modifications to the surrounding natural environment, extent of access, size of lake, shoreland development, and existing management controls are examples of additional criteria that proved useful in the classification process. Each pond or lake was cross-classified using the four initial categorizations, use level, and the above criteria.

2/ Wilderness / solitude lakes were the exception to this general rule. By definition, high use does not occur on solitude lakes, however, low to medium use may exist.

Bean Pond in Lyndon, for example, is managed for non-motorized recreation, has relatively few recreationists, provides substantial isolation from the sights and sounds of mankind, and allows for a considerable degree of interaction with the natural environment. Using the proposed classification scheme, Bean Pond was considered a remote, non-motorized, low use lake. Lake Bomoseen provides an example where there is a wide range and mix of recreation activities and all types of watercraft are in evidence. In this instance, the resource was classified as a high-speed motorized lake, with high concentrations of use, where interaction with the natural environment was not a primary objective of the experience. Colchester Pond illustrates a limited access lake with minimal recreation use. Only two private owners have abutting property, restricting use and the number of encounters occurring on the lake. The lake has a relatively unmodified natural environment and provides an opportunity to escape the sights and sounds of humans. These setting characteristics suggested classifying Colchester Pond as a low use, non-motorized recreation lake.

The aforementioned characteristics or indicators function interdependently. In most instances combinations of the setting characteristics delineated the most appropriate type of recreation experience opportunity. For example, a remote, low density lake with limited access, and no shoreland development was classified as wilderness. This lake, however, would be classified differently if it lacked the remoteness associated with solitude (e.g., Colchester Pond). In these cases, setting inconsistencies became key indicators of the experience categorizations. The four categories when considered in conjunction with additional defining attributes (e.g., amount of use, remoteness, etc.) enabled management to set objectives for opportunities that met the diverse experiences users desire. While such categories of experience/use environments provided for development of standardized management actions, they also allowed for individualized lake management plans and implementation strategies. Thus, similar to a single large resource with many different subunits (e.g., a large national forest with both wilderness areas and developed campgrounds), visitor impact management objectives for a state-wide planning context should incorporate a range of acceptable impact levels to accommodate the diversity of environments and experience opportunities.

Step 3: Selection of Key Impact Indicators

The third step in the VIM process involves identifying measurable indicators for the pertinent management objectives. Once the objectives described the type of environmental conditions and visitor experiences to be provided, this step served to identify how the specified conditions and experiences were to be measured. The specific decision required here was the selection of the most important variables or attributes to serve as indicators of the desired conditions.

While there was no single indicator or set of indicators that were appropriate for all lakes and ponds, commonalities within and between lake classifications were sought. Several criteria were used to evaluate the potential usefulness of alternative indicators. Useful indicators included those that were directly observable, relatively easy to measure, directly related to the objectives for the lake, sensitive to changing use conditions and amenable to management. Depending on the resource, any of the defining characteristics discussed in Step 2 were considered key impact indicators. Selection of one indicator over another depended on the specific characteristics of the lake and the level of measurable impact (low, medium or high).

A nominal group meeting and a Delphi survey were also used to identify key impact indicators across all lakes and ponds in the state. Previous applications of the VIM process highlighted the importance of including representation of a diversity of interest groups (e.g., managers, users, property owners, etc.). When applied to a state-wide perspective, it is equally important to incorporate regional interests.

The goal of the nominal group was to generate issues of common concern and arrive at a consensus regarding the importance of each. Eleven experts participated in the nominal group session, representing a range of interest groups and agency perspectives. The results of these sessions were used to develop the Delphi survey. The Delphi sequence was conducted through a series of three rounds of questionnaires presented to a panel of 97 individuals, representative of various interest groups and geographic locations in the state. The surveys used in the Delphi sequence not only asked questions about significant issues, but also provided feedback to the panel members regarding the degree of group consensus.

Respondents to the survey were asked to evaluate 21 specific issues (e.g., milfoil spread, amount of development, access, recreational conflict, etc.) in terms of the severity of the problem, the extent to which the issue was being addressed, and whether they perceived the issue to be a future trend. Overall, the results indicated that physical impacts on Vermont lakes (milfoil spread, development around lakes, pollution from run-off, and excessive weed growth) are not only the most severe problems currently facing recreation managers, but are also likely to continue to be problems in the future. Social impacts such as amount of recreation use, year round recreation use of lakes, insufficient power boating access, and conflicts between recreation user groups, while not considered to be extreme problems at this time, were seen as areas of major concern for the years to come.

Graphing the responses to these three sets of questions highlights these interrelationships. Figure 1 plots the severity of each issue against the extent to which the problem is being addressed, while Table 1 describes the items in each of the quadrants. Regardless of how severe a problem was perceived, the panel members did not believe the issue was being dealt with adequately. From a management perspective, the items in the lower right quadrant of Figure 1 represent the key impact indicators. These issues were considered extreme problems that are not being addressed. The top three issues in Table 1 show that the most important impact indicators are ecological in nature (milfoil spread between lakes, polluted run-off into lakes, excessive aquatic weed growth). A social indicator ranked fourth (development around lakes and ponds), while a managerial indicator ranked fifth (insufficient shoreland zoning).

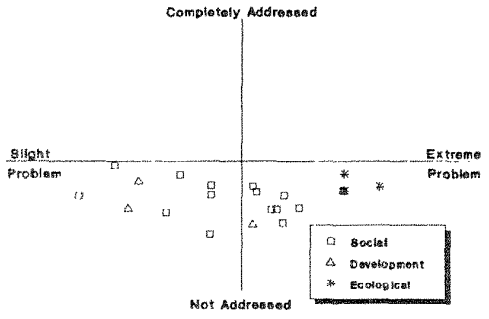

Figure 1. Vermont lake problems are being addressed.

Table 1. Perceived problems versus perceptions problems are being addressed.[1]

Lower Right (Perceived Problem / Not Addressed)
- Milfoil spread between lakes
- Polluted run-off into lakes
- Excessive aquatic weed growth
- Development around Vermont lakes and ponds
- Insufficient shoreland zoning
- Specialized user groups influencing decision makers
- Too much power boating on remote lakes
- Lack of stable funding sources
- Conflict between recreation user groups
- Pressure on local & state govt. to regulate use
- Amount of recreation use of lakes
- Development of undeveloped lakes

Lower Left (Not Perceived as Problem / Not Addressed)
- Insufficient swimming access to lakes
- Pressure on local & state govt. to provide services
- Winterization of lakeshore homes
- Not enough handicap facilities and access
- Year round recreation use of lakes
- Not enough recreation facilities and services
- Utility company constraints on access
- Insufficient power boat access to lakes
- Insufficient trail access to undeveloped lakes

1. Quadrant descriptions are based on Figure 1.

Figure 2 plots the intensity of the 21 items against panel members' perceptions that the problems are increasing. Table 2 identifies the items in each quadrant. With respect to these relationships, items contained in the upper right quadrant were the immediate focus of management. Again, the first five items in Table 2 are the same as those in Table 1. Items in the upper left quadrant of Figure 2 (e.g., insufficient swimming access, more government services, winterization of summer homes), were considered less problematic at this time, but are likely to become key impact indicators in the future.

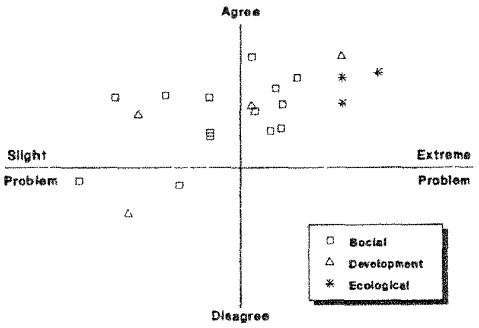

Figure 2. Vermont lake problems are increasing.

Overall, the findings from the Delphi survey indicated that the key impact indicators for Vermont lakes and ponds were primarily ecological. Social and managerial indicators, while considered important issues, were judged to be less problematic at this time. These issues, however, may increase in importance as the demand for water-based recreation grows.

Table 2. Perceived problems versus perceptions problems are increasing.[1]

Upper Right
(Perceived Problem / Agree Problem is Increasing)
Milfoil spread between lakes
Polluted run-off into lakes
Excessive aquatic weed growth
Development around Vermont lakes and ponds
Insufficient shoreland zoning
Specialized user groups influencing decision makers
Too much power boating on remote lakes
Lack of stable funding sources
Conflict between recreation user groups
Pressure on local & state govt. to regulate use
Amount of recreation use of lakes
Development of undeveloped lakes
Upper Left
(Not Perceived as Problem / Agree Issue is Becoming Problem)
Insufficient swimming access to lakes
Pressure on local & state-wide govt. to provide services
Winterization of lakeshore homes
Year round recreation use of lakes
Not enough recreation facilities and services
Insufficient power boat access to lakes
Lower Left
(Not Perceived as Problem / Disagree Issue is Becoming Problem)
Not enough handicap facilities and access
Utility company constraints on access
Insufficient trail access to undeveloped lakes

1 Quadrant descriptions are based on Figure 2.

In general, the nominal group and the Delphi survey proved useful for identifying impact indicators on a state-wide basis. This technique could be equally helpful for defining issues for a single site.

Step 4: Selection of Standards for Impact Indicators

Step 4 adds one further layer of specificity to the VIM process by calling for standards for the previously selected impact indicators. This step, in essence, calls for a restatement of management objectives in quantitative terms. Standards differ from management objectives by specifying appropriate levels or acceptable limits for the impact indicators designated in Step 3. The standards selected become the basis against which the existing situation is evaluated. Thus, this step serves the important function of describing the environmental conditions and type of experience to be provided in definable units of measurement.

Specific standards for evaluating each lake were established. For some indicators, the standard was the total absence of the impact. The presence of *any* Eurasian milfoil, for example, was judged to be unacceptable. For other indicators, a range of acceptable impacts was defined. Littoral zone coverage, for example, was considered acceptable if less than 25 percent of the lake was covered. Greater than 50 percent coverage was deemed high impact. Values between these extremes were evaluated as moderate impact.

Some of the standards could be established for the entire state (e.g., milfoil). Other standards, however, had to be lake specific and tied to the management objectives for that lake. Development standards for lakes classified as wilderness, for example, differed from the standards applied to high density, high use lakes. In the former situation, zero development was the standard, while standards in the latter case varied according to the desired type of experience.

Step 5: Comparison of Standards & Existing Conditions

After the first four steps in the process clarified the conditions the state was trying to achieve for a given lake, the existing situation could be compared to this desired state of affairs. This step requires an inventory and assessment of current conditions for those impact indicators that were selected in Step 3. This assessment does not necessarily require elaborate and costly studies. What is necessary, however, is a level of observation and measurement that provides for a reasonable comparison of existing conditions and their corresponding standards.

When no discrepancy between current measures of pertinent indicators and corresponding standards exists, the managers can monitor the situation for future changes. In this situation, the lake or pond is currently providing the environmental conditions and type of experience that are defined as appropriate for the area in Step 2. The monitoring should include the impact indicators that are most susceptible to future changes, as well as the use patterns that may lead to changes in the status of these impact indicators. Because these data are collected prior to the time problem conditions are identified, the evaluation of the probable causes of the problem can be more easily determined.

When current measures for certain indicators do not meet the standards for the lake or pond, a problem situation is documented. It is then appropriate to move on to the identification of probable causes of the unacceptable impacts. The State of Vermont is currently in the process of making these comparisons.

Step 6: Identification of Probable Causes of Impacts

Because of the many potential factors that may contribute to impact conditions, the challenge of Step 6 is to isolate the most significant causes(s) of the problem situation. This task is approached by examining the relationships between visitor use patterns and the impact indicators that exceed their respective standards. In examining potential causal factors, it is important to consider the full range of specific aspects of visitor use that may influence the situation, including type of use, size of groups, time of use, concentration of use, frequency of high use periods, overall amount of use, and behavior of visitors. It is also important to remember that use/impact relationships may be mediated by site characteristics and consequently may vary for different times and places.

The introduction of Eurasian milfoil, for example, is typically caused by a change in the numbers or types of visitors using a lake. Milfoil becomes entangled in boat motors or trailers. Visitors who have boated on a lake where milfoil is present, may inadvertently introduce the weed to another lake where none exists. In situations where the number of motor boaters is increasing or where motor boating is being introduced on a lake, the probability of Eurasian milfoil spread also increases.

Step 7: Identification of Management Strategies

With some understanding of how the amount, type and distribution of people using a given area affect the quality attributes of the area and experience, it is possible to identify a range of alternative management strategies. Just as many aspects of use contribute to the problem, many management alternatives are available for dealing with the problem. It is important at this phase to focus on the probable causes of the visitor impacts rather than on the impact conditions themselves. It is also important to recognize that one may never have a complete understanding of the causes underlying certain visitor impacts, nor can one predict exactly how a given management action will affect a particular problem situation.

Management techniques aimed at reducing a particular impact problem may adversely affect other aspects of the situation or may introduce other problems for managers. A given management option may seem quite desirable according to some criteria but less desirable from the perspective of other criteria. A strategy with high odds of producing the desired outcome may be impractical due to the difficulty or cost of implementation. It may also be inadvisable if it causes as many problems as it solves in terms of visitor acceptance or other experience indicators. In the case of Eurasian milfoil, a program could be established to inspect boats at launch areas. Milfoil found on boats could be eliminated before entering the water. This management strategy, however, is costly to implement due to increased personnel requirements, and may cause increased congestion at the launch site. Less costly alternatives might involve boater education about milfoil spread, and/or volunteer monitoring of boats at the launch areas.

Step 8: Implementation

Because lakes and ponds classified as wilderness are the most susceptible to impacts, these resources should receive priority when implementing the identified management strategies. Appropriate management actions for lakes in the remaining classifications should be taken as soon as the necessary resources are available. Given the highly variable nature and causes of visitor impacts, management programs designed to deal with these impacts need to be flexible and quick to respond to changing conditions.

At the present time, for example, milfoil is most common in southern Vermont, and least common in the Northeast Kingdom. If evidence of the presence of milfoil is found in the northeast, a combined effort of boater education and boat inspection by lake association volunteers may need to be implemented quickly to curb further spread.

Once a management program is implemented, it is important to continue monitoring the key impact indicators and use patterns to determine whether the management actions are producing the desired outcomes without altering other characteristics of the experience. Regardless of the outcome of any particular step in the VIM process, continuous monitoring is essential for understanding the current status of each lake and pond and predicting when unacceptable impacts may occur.

Discussion

The Vermont lakes and ponds recreation study highlighted similarities / differences between multiple versus single resource applications of the Visitor Impact Management process. When applied to multiple locations, it was important to consider the unique physical and social characteristics of each resource. In essence, the eight steps in the VIM process were conducted for each resource separately. However, because commonalities between the lakes and ponds were evident, it was possible to develop a classification scheme for setting objectives (Step 2), identifying key impact indicators (Step 3) and specifying standards (Step 4) within broad categories.

This classification scheme offered several advantages. First, categorizing the lakes provided a structure for comparing and contrasting the diversity of environments and experiences within the state. Second, the framework established a foundation for setting objectives by differentiating what is currently offered from what should be offered. Third, the categories of lakes allowed for broad policy development and initiatives. Rather than dealing with each lake individually, state legislators and planners could mandate appropriate management actions for different classes of lakes. Fourth, by considering the state as a system of lakes, it was possible to assess differences in geographic distribution of lake classes within and between regions.

The state-wide evaluation process allowed for consideration of other conceptual issues related to the VIM process. For example, the potential substitutability of resources could be considered. When the classification process highlighted deficiencies in the availability of particular experience opportunities (e.g., wilderness lakes) in sections of the state, protecting the existing areas became paramount since there were no substitutes. Alternatively, if lakes of the same class were common in a region, managers could reduce use levels or change the type of use on a specific lake, since other similar resources existed. Because resource substitutes are not necessarily symmetrical (Shelby and others 1989), and because the other lakes may not have the capacity to absorb the influx of additional visitors, information about resource characteristics still needs to be interpreted in light of corresponding information about user perceptions of those characteristics.

The nominal group and Delphi survey proved useful for determining the extent of agreement about key impact indicators (Step 3). For both site-specific and region-wide applications of VIM, a diversity of interest groups should be represented in this step. With a regional focus, representation of the different geographic areas is always necessary. For site-specific evaluations, the significance of the resource determines the extent of geographic representation needed. Applying VIM to a nationally known landmark, for example, would require broad input. Less diverse feedback would be necessary for a small locally used resource.

In this study, graphing the potential impact indicators highlighted the interaction between the perceived severity of problems, the extent to which they were currently being addressed, and the likelihood of the indicator becoming a future trend. This technique is useful for either site-specific or regional applications of VIM.

Regardless of the focus, site-specific or region-wide, both ecological and social standards need to be established for specific resources (Step 4). In regional applications, some of the standards will cross all resources. The standard of no milfoil, for example, was applied to all lakes and ponds in Vermont. Other standards may not be universal. The amount of acceptable development, for example, varied according to the lake's classification (i.e., zero for wilderness, higher for other classes).

Steps 5 through 8 of the VIM process are also similar for both site-specific and region-wide applications. With a regional focus, however, they must be applied to each resource individually. This process does increase labor costs and is more

time consuming, but by classifying the resources into discrete categories, managers can prioritize areas of greatest need. Wilderness areas, for example, should receive priority because they are more sensitive to change. Once modified, they are lost. Impacts occurring on other classes of lakes (e.g., lakes managed for high speed use), may be more acceptable to both managers and users. Management strategies for these lakes can be implemented as funds and resources become available.

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OUTDOOR RECREATION

INNOVATIONS IN OUTDOOR RECREATION

RIVER RECREATION MANAGEMENT OPPORTUNITIES IN HYDROELECTRIC RELICENSING

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Between now and 1993, more than 200 existing hydroelectirc projects will come up for relicensing before FERC, the Federal Energy Regulatory Commission. This provides a rare opportunity for agencies and individuals to markedly influence the ecological and recreational balance of these projects. This paper presents an overview of the relicensing process, describes some of the types of river recreation issues that can be addressed through the process, and explains how you can become involved.

Between now and 1993, more than 200 existing hydroelectirc projects will come up for relicensing before FERC, the Federal Energy Regulatory Commission. In Michigan, the Huron-Manistee National Forests are participating in the relicensing process for 10 of these projects, which involve 11 dams and 4 river. These include the AuSable, a designated Scenic River and the Pine and Manistee, which are currently proposed for designation under the W & S Rivers act. Here in the northeast, the process is also on going for many rivers with significant recreational value. The Androscoggin River in New Hampshire and Maine with 12 dams, the Kennebec River in Main with 8 dams and the Genesee River here in New York with 4 dams are a few examples. For most of these dams, indeed, for many of these rivers, this is a once in a lifetime opportunity for agencies and individuals alike to markedly influence the ecological and recreational balance of these projects.

My purpose here today is to tell you very briefly what the relicensing process is all about, to give you some ideas of the types of river recreation issues that can be addressed through the process and to let you know how you can become involved.

With the passage of the Federal Power Act in 1935, Congress asserted federal supremacy over hydroelectric facilities and established FERC to regulate their operation through the issuance of federal licenses. Over the next 10 to 15 years the FERC licensed most of the existing dams that had been built between 1910 and 1935 for 50 year terms. Consequently, we have this large number of license renewals coming due here in the early 90s. Recognizing this fact, Congress decided revisit and amend the Federal Power Act with the Electric Consumers Protection Act in 1986.

As opposed to the Federal Power Act and other hydro power legislation that had been enacted in the interim years between 1935 and 1986, ECPA was primarily oriented toward addressing the environmental impact of hydro power dams. It says that hydro projects should be licensed with equal consideration being given to energy conservation, fish and wildlife protection, the enhancement and preservation of recreational opportunity and other aspects of environmental quality, as well as to the traditional purpose of water power development. The legislation's architect, Congressman John Dingell, said that these projects, built and licensed in another age, need to undergo the scrutiny of today's environmental awareness before new licenses are issued for their continued operation.

The rules that implement ECPA provide for a very significant role in the relicensing process for resource management agencies and citizens and also for indian tribes when the project affect reservation lands. There has been a considerable amount of attention paid to the fisheries management aspects and attendant water flow issues associated with relicensing. Receiving less attention, at least in my experience in the north central states, has been some off the other issues that can be addressed under the legislation, including recreation. This is often due to the way state resource management agencies are organized and which division has been given primary relicensing responsibility, rather than the agencies ignoring some of these other resource areas. I don't know what the experience has been to date here in the northeast. However,with most license applications being due by the end of this year, the next 6 months is a very critical period. The new licenses will have 30 to 50 year terms, so, as I noted earlier, this is truly a once in a lifetime opportunity to address the recreation issues, as well as other issues, associated with these projects. Specifically what might some of these opportunities be?

The first source for determining recreation needs for each facility should be available from the utility itself. As a part of the relicensing process, dam owners have been conducting environmental studies to provide an information base for the decisions related to their new license. Included in these studies should be on related to recreation needs. This study should be available directly from the utility or from the state agency personnel involved in relicensing work. It should include a complete inventory of existing facilities and there condition along with an assessment of demand for additional facilities. Development and quality maintenance of camping, picnicing, and access facilities on the reservoirs created by the dams, is an obvious responsibility. In most cases utilities have developed and/or leased lands to local governmental units to develop and operate such facilities. May of the facilities, however, are relatively old now or may not be of very high quality. They may need substantial maintenance work or in many cases, complete rehabilitation. These improvements should be sought in the relicensing process, as well as any new facilities or expansions that can be justified based on future needs. Apart from the reservoir accesses, access to riverline stretches, particularly below the dams is also an appropriate discussion items. Recreational trails should also be considered where the opportunity and demand for such facilities exist.

River flows that are favorable to recreational boating are another major category that is open to negotiation in this process. River flows are generally the single most contentious issue associated with the licensing process. It is central to the efficient economic operation of the power house, the quality of fish habitat, and downstream erosion and cultural site degradation, as well as to recreational boating. In order to strike an optimum balance on this issue the recreation interests must be well represented.

Within these broad categories the FERC can and has required many types of recreational developments in hydro project licenses. However, they do so largely based on the negotiations that take place between resource agencies, citizens and the utilities, rather than of their own accord.

So, how can you become involved? First, I would recommend that you contact your state resource management agency and find out who is responsible for hydro relicensing. They should be able to provide you with the names and contact information for the people at the utility and at FERC who are handling the process for the rivers and projects you are interested in. In addition, they should be able to provide you with a substantial amount of information on the status of the relicensing process at these facilities and specifically, who is providing state leadership for recreational issues.

The fact that most final applications are due at the FERC by the end of this year means that resource agencies will be receiving draft applications for review by June or July. This is the most effective time for you to become involved in the process. You can do that by providing comments directly to the agencies and the utility. The utility is required to include these citizen comments in the records they send to the FERC and to address the concerns raised in their license applications. Any concerns or needs that you can tie to comprehensive resource management plans, such as river basin plans or statewide recreation plans have a stronger standing with the FERC process as a result of provision of ECPA.

If you don't feel your concerns are adequately addressed in the license application you can also become a formal party with legal standing in the process by filing a motion to intervene once the utility has filed the application. If you are contemplating such action, an essential guide is Rivers At Risk: The Concerned Citizen's Guide to Hydropower, which is available from American Rivers in Washington, D.C.

In addition to state agencies and the utilities, the National Park Service has individuals in their regional offices who are responsible for relicensing recreation issues. Finally, there are a number of conservation groups who are heavily involved in the relicensing process, led by American Rivers, who can help you out.

If you have an interest in a northeast river that is affected by hydroelectric projects I would urge you not to let this opportunity pass by without involving yourself to see that these issues are addressed.

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HOW THE WHITE MOUNTAIN NATIONAL FOREST IS ADDRESSING ACCESSIBLE RECREATION OPPORTUNITIES FOR EVERYONE

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The White Mountain National Forest recently began a new direction in improving accessibility of outdoor recreation opportunities for people of all abilities. For 25 years under mandate of existing laws the Forest made facility and site specific efforts at accessibility. A Forest proposal in 1990 to construct motorized vehicle access for people with mobility disabilities to a backcountry pond proved the catalyst for a review of our accessibility policy. The result is a more wholistic and participative direction in providing accessibility of outdoor recreation opportunities for everyone.

General

People are searching for links to the land, it is our job to help them find those links; we must ask ourselves, will what we are doing reconnect american people to the land? (G.Elsner, 1991 NERR Conference)

Specific mandates of law and regulation on accessibility has existed for 25 years. The Architectural Barriers Act (ABA) of 1968 requires buildings constructed or renovated with Federal money be accessible to and usable by people with disabilities. Based on this Act, Uniform Federal Accessibility Standards (UFAS) were developed and are enforced by the Architectural and Transportation Barriers Compliance Board (ATBCB). The Rehabilitation Act of 1973, and the Rehabilitation, Comprehensive Services and Developmental Disabilities Act (1978), added "handicap" to the more commonly known list of prohibitions against discrimination on the basis of race, color, religion, sex, age and national origin. The Americans with Disabilities Act (ADA) of 1990 prohibits discrimination against people with disabilities in all public accommodations and transportation.

Under these laws, especially the first two, the Forest addressed outdoor recreation opportunities for people with disabilities. Early efforts were simplistic, we assumed we knew what people with disabilities wanted for outdoor recreation opportunities and how to provide it. Law and the specifications in UFAS provide the basic standards and reinforced our assumptions. Some campgrounds, picnic areas, and day use areas were made accessible by altering the toilets and tables to meet the standards. It was thought that some roadside facilities were what people with disabilities desired and would use. The specifics of Law were met, but not the intent.

In addition, managers seemed to lack the sensitivity to recognize, evaluate and correct the many invisible barriers to people with visual, audio, mobility, and other disabilities.

Why Change?

The need to expand our concept of accessibility was recognized and acted on when the decision and subsequent controversy on accessibility to a backcountry pond brought it to the forefront. This began in 1988 when the Forest, in response to a public request, proposed to improve sections of a seven mile route for motorized vehicle access by people with mobility disabilities into a backcountry pond (Flat Mountain Pond), adjacent to a Congressionally designated Wilderness Area (the Sandwich Range Wilderness). In February 1990, following a study and public response, the Forest announced its decision to improve the route to Flat Mountain Pond. Several organizations and an individual appealed the decision. Following lengthy discussions with the appellants, in November 1990, the Forest Service withdrew its decision. In the decision Rick Cables, Forest Supervisor, said:

> During discussions on the appeals, the Forest Service concluded that they did not understand as fully needed the outdoor recreation needs of the disabled and had not done all that should have been done to help others understand them as well. The Forest will, therefore, try to learn and help others to learn more about that issue before taking any further action. The first step in doing that will be to invite persons from the disabled community and others who are knowledgeable in the field of outdoor recreation for the disabled to to form a work group and meet with the Forest and discuss the settings, activities, and facilities that might be suitable components of the Forest's recreation program.

How is Change Identified?

The Forest then developed a strategy for accessible recreation on the Forest. That strategy stated the need for more information. The information should answer the questions, 1) who are the expected users? 2) what types of recreation opportunities would these users like to share? 3) what on-the-ground conditions are necessary for a recreation opportunity to be available?

The strategy would be consistent with existing policies, particularly the Recreation Opportunity Spectrum (ROS) framework. ROS is a nationwide system for managing recreation in the Forest Service. Recreation on the Forest is more than just camping, fishing, and hiking. Research has shown that people choose a specific setting for each of these activities in order to realize a desired set of experiences. For example, camping in a large undeveloped setting with difficult access and few facilities offers a sense of solitude, challenge, and self-reliance. In contrast camping in a setting having easy access and highly developed facilities offers more comfort, security, and social opportunities.

The Recreation Opportunity Spectrum, or ROS offers a framework for understanding and managing these relationships and interactions. Maintaining a broad spectrum of ROS classes is very important to provide people with choices. The end product of recreation management is the experience people have. The key to providing most experience opportunities is the setting and how it is managed. The primary setting indicators are type of access, remoteness, naturalness, facilities, social encounters, visitor impacts, and the visitor themselves. The ROS system is used by managers in guiding on-the-ground actions that facilitate (or hamper) various recreation experiences.

ROS classes range from primitive to urban. In general, the primitive end of the spectrum provides recreation experiences that are derived from a natural appearing environment with no motorized vehicles and low visitor interaction. The basic recreation experience is isolation, remoteness, independence, closeness to nature, and self reliance with a high degree of challenge and risk.

At the other extreme, the urban recreation opportunity class is facilitated by an environment that is highly modified and developed, more like a traditional urban park. The recreation experience is primarily built around affiliation with others. Challenge and risk opportunities are unimportant. The classes between primitive and urban are: semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural.

As a starting point for the strategy, the Forest solicited and is considering consumer generated recommendations for making White Mountain National Forest recreation accessible to persons with disabilities. To do this we formed an Accessibility Work Group with the New Hampshire Governor's Commission on Disabilities. Members were also drawn from Maine and Massachusetts, and reflect a variety of disabilities and recreation interest. Their role is to; 1)research and report population of disabled citizens within the Forest market area, 2)recommend criteria for on-the-ground conditions to be met in providing a wide range of accessible recreation opportunities, 3)recommend goals for recreation opportunities and associated improvements to meet the need for accessible recreation choices and 4)recommend education and accessibility awareness training programs for Forest Service staff and the Forest user community. It is anticipated that this work will be completed by Fall 1991.

At the same time the Forest began to implement this strategy on a local level the Forest Service National Office was going through a similar examination. An Accessibility Task Force was formed at the National Office in 1990 which identified a series of "key policies" defining a strong foundation upon which a long term program serving persons with disabilities could be built. These policies aren't a serious departure from current policies but a clearer articulation of current law and regulation within the framework of accessibility for all. This work didn't gain attention until we became involved in our local effort - and they provided excellent direction consistent with our local effort. They can be summarized as follows:

All recreation visitors, including persons with disabilities, should have the opportunity to participate in or use the benefits, services, and information available at buildings and facilities open to the public.

The Forest Service should strive to provide a diversity of recreation opportunities for persons with disabilities comparable to that offered other visitors.

The Forest Service should strive to provide programs and services in a setting that allows persons with disabilities to interact with other visitors and does not separate them from the able-bodied population.

In the provision of recreation programs, services, and facilities, the Forest Service should strive to achieve the highest level of access to persons with disabilities practicable considering the experience level, capabilities of the area, nature of the program, and cost.

The Forest Service should involve persons with disabilities in the planning, construction, renovation, and operation of recreation programs, activities, and facilities to establish the optimal mix appropriate to each specific geographic area.

The Forest Service must develop and maintain reliable information on the accessibility of recreation facilities, services, and facilities for use by persons with disabilities.

The Results

The output of the work groups has been very valuable and worthwhile. The development of the strategy, the implementation of the work group process and involvement in the work groups were also important in increasing our accessibilty awareness. The results, arranged by work group tasks are:

Research and Report Population of Disabled Citizens Within the Forest Market Area

This task was an effort at getting an expression of demand, we wanted to know how many people with disabilities were going to use the Forest. A common theme at the meetings was that people with disabilities have the same needs and mirror interests for outdoor recreation opportunities of the public at large. The concept of National Forest Recreation management is to maintain the greatest range of recreation opportunities consistent with the resource so as to provide the greatest diversity of recreation experience opportunities to the public. Persons with disabilities are really a part of the public. They are not to be looked at as a separate demand group but as part of the public demand as a whole. If we maintain a range of ACCESSIBLE recreation opportunities we meet the FS recreation management policy and make Forest recreation opportunities available to people of all abilities.

This means that 1)program accessibility and activity accessibility need to be included in our planning, information and implementation 2)the ROS framework the FS uses for recreation management is consistent with accessibility as we don't change the setting to bring in accessibility we build accessibility into what's there and 3)we must make sure all our sites facilities are considered for accessibility. We need inclusive design, planning and construction. We need to change the "design bias" from one of exclusivity to one of inclusivity.

Recommend Criteria for On-the-ground Conditions to be Met in Providing a Safe Range of Accessible Outdoor Recreation Opportunities

In the group discussions it became apparent the Forest didn't take the wholistic view in relation to accessibility. We looked at this facility or that facility but didn't look at the entire area for accessibility. An example, at one particular roadside stop we made the toilet accessible and we made the short path from the toilet to the parking accessible. But we failed to recognize that in this particular location there was also a gated road easily travelable by wheelchair labeled "foot traffic welcome". But there was no way for the person in a wheelchair to access the gated road (although they could easily get to the gate) because the design of the gate effectively prohibited wheelchairs. Another example, we sometimes take the person with disabilities partially into the area and then make it impossible for them to get to the main attraction. We did this at the Rocky Branch Scenic Area where the parking lot and toilets are accessible but people with disabilities cannot get on the bridge for a scenic vista of the falls. We have to lengthen our view to include the entire area not just specific facilities.

We used UFAS which doesn't translate to the woods. We've missed the boat using these standards alone to design our facilities. The work group discussed the national effort to establish design standards for accessibility - the interim draft Guide. The group focused on the the guides content and identified several shortfalls in that guide. Some of the groups concerned that surfaced were, 1)the use of motorized prosthetic appliances was not well addressed, 2)some of the terminology was weak, - they recommended several places where wording should be changed from "should" to "will" or "shall", 3)some of the legal references were not inclusive - they recommended others, 4)there were several technical drawings and specification they though were inconsistent with the real need, 5)there was lack in some places of identifying the needs of people with visual or audio impairments etc. It was a very worthwhile exercise, we are continuing with the review of the Guide.

It was also identified that providing recreation opportunities in the more primitive, rustic or less developed areas provides a new challenge for the manager and for the recreationist with disabilities. Until this time accessibility has been measured against standards such as barrier free architectural designs, ramps and paved paths designed for urban areas. In more natural areas these standards are difficult to apply, and in most cases would require such serious alterations or changes to the recreation environment that the desired recreation experience would be destroyed. As we have discovered one of the key elements to the manager and recreationist alike in providing and participating in recreation in a backcountry environment will be a higher level, and more accessible information about the travel condtions and situations that will be encountered.

Recommend Goals for Recreation Opportunities and Associated Improvements to Meet the Need for Accessible Recreation Choices

This is a distinct and separate step from the work group. The work group will write the "text book" and the next step is applying the information in our practices on the ground through our usual decision processes. But, they can be a pool of experts to assist as long as they are given access to our usual decision process. When we get to the point of action, doing things on the ground, we must provide opportunity for our full spectrum of users including this particular community of users to provide input. The group expressed a willingness to become involved in Interdisciplinary Team reviews of proposed projects and evaluations. This would serve an additional role besides expert advice, that of instilling accessibility awareness in our employees.

The Forest Plan and other Forest policies need to be examined in the light of accessibility to see if there are adjustments to be made. There most likely are inadvertent biases against people with disabilities. One example that came up in the group discussions was the direction given for closing system roads, no consideration was given to their use, motorized or wheelchair, by people with disabilities.

Recommend Education and Accessibility Awareness Training for Forest Service Staff and the Forest User Community

It was stated at the meetings that the manager seems to have a problem of perspective. We haven't accepted the person with disabilities as a person and we haven't trained and educated our staff to this end.

Including people with disabilities in our planning and public involvement processes will not only give us a better job it will provide accessibility awareness as well. The mixing of Forest employees with this group of experts will undoubtedly increase our sensitivity to people with disabilities. In addition to this informal training the work group is planning to help the Forest in presenting more structured accessibility awareness training programs.

How does what we've learned in this new direction match with what our earlier view of accessibility? Our early efforts were shortsighted in matching only certain recreation facilities to people with disabilities as opposed to the longer view of providing a wide range of accessible recreation opportunities, from developed camping and picnicking to general undeveloped backcountry. Until recently most managers were oblivious to the relationship between recreation opportunities and people with disabilities. People with disabilities are looking for the same kinds of recreation experience opportunities as the millions of visitors without disabilities on the Forest. We only need to make sure they have access to these opportunities.

What was wrong in providing access to toilets and tables at campgrounds and picnic areas? - nothing! but it addresses only part of the spectrum of outdoor recreation opportunities. About half of the 6,000,000 recreation visits provided by the Forest are road related; campgrounds, picnic areas, driving for pleasure, etc. The other half are backcountry kinds of recreation opportunities of all kinds from those near the road to those miles from any road. Many times these are the same activities but are being done in different settings. The Recreation Opportunity Spectrum (ROS) is used to define this range of settings, relating them to outdoor recreation opportunities.

What is needed for a course correction to make outdoor recreation opportunities accessible to those people with disabilities? UFAS standards were not enough. What's needed is a sensitivity to all types of disabilities, a close working relationship with all kinds of experts including experts who have learned by being. Managers were relying too much on published specifications without a real insight of what was desired and necessary by those who are looking for these outdoor recreation opportunities and what information is communicated to recreationists. Information communicated in traditional ways does not make the recreationists that is disabled aware of the opportunities nor doe it provide sufficient information for the recreationist with disabilities to match his or her skills and desires to the situation.

This new effort, addressing a participative and wholistic view of accessibility appears to fit within the framework of Forest recreation management principles while having the ability to improve accessibility for outdoor recreation opportunities for everyone, people with and without disabilities.

MARYLAND DEPARTMENT OF NATURAL RESOURCES CAMP INITIATIVES PROGRAM

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The Camp Initiatives Program was developed to increase revenue and visitation through a series of policy changes. During the summer of 1990, the program was evaluated at six Maryland State Parks and found to increase revenue and visitation by 3% and 16%, respectively. More intensive marketing efforts, implementation of a computerized reservation system, increased community relations, and status of interpretive programs were specifically addressed as management recommendations. With minor policy revisions, the Camp Initiatives Program will continue to enhance the visitor experience and meet management objectives.

Introduction

Natural Resource managers are continually challenged with providing quality recreational services and more so in light of recent budget cuts at the federal, state, and local level. A review of current policy is warranted to determine the optimal balance between services and available resources. This review may result in innovative approaches to accomplishing the overall goals of an agency.

As a result of substantial reductions in the operating budget, the Maryland Department of Natural Resources-Forest and Park Service (DNR) began to focus on past, present, and future visitation with the prospect of increasing revenue through increased visitation. Specifically, a decrease in camping visitation in 1988, 1989, and a projected decrease for 1990 was found. Efforts were focused on the camping sector to increase overall revenue and expose more people to Maryland State parks. New policies were designed to encourage the use of Maryland State park campgrounds. Incorporating these new policies, the Maryland Camp Initiatives Program was established in April 1990 to encourage use of Maryland State parks and enhance the recreational experience.

Prior to the 1990 Camp Initiatives Program, DNR camping policies included: 1) camping on a first come, first serve basis; 2) a pet policy which allowed animals in designated areas in 5 parks; 3) a two week limit on length of stay; and 4) employment of seasonal naturalists to provide nature and recreational programs. The Camp Initiatives Program incorporated the following five policy changes:

1) An expanded reservation system allows campers to reserve up to one year in advance with the option to reserve sites for other groups.
2) Pets were permitted at 4 of the 6 pilot areas.
3) No limit was placed on the length of stay (except Rocky Gap State Park).
4) A Campground Programmer was hired to specifically provide tourist information, recreation, and nature programs for campers.
5) "Camping packages" were developed in cooperation with local merchants/businesses to encourage a partnership and symbiotic relationship with the community.

Methodology

Six pilot parks were chosen to evaluate the success of the Camp Initiatives Program. The six parks (i.e., Swallow Falls, Rocky Gap, Greenbrier, Point Lookout, Elk Neck, and Pocomoke River State Parks) were selected to represent the various geographical areas in Maryland and for the ease of program implementation.

An on-site survey was conducted to evaluate the impact of policy changes, as well as to gain information about Maryland State park campers. The survey addressed camper's past experience in Maryland State parks or forests, frequency of visitation, importance of, and satisfaction with, various site and service attributes, and attendance at interpretive programs. Two hundred and thirty five on-site interviews were conducted from Friday through Sunday during the months of June and July, 1990. A list of occupied sites was provided by the park manager and one adult per occupied site was selected. Additionally, campers with pets were contacted to assure representation of this user group. In addition to conducting the formal survey, interviewers remained in the campgrounds throughout the survey weekends to informally observe campers.

Findings

Twelve states and the District of Columbia were represented by the 235 campers interviewed. Fifty-six percent of the campers were male and 44% were females. The median age was between 34-49 years, with 40% aged 21-34 years and 41% aged 35-49 years. Young adults comprised only 1% of the campers and seniors (i.e., campers 65 years or over) comprised only 4%. Children were well represented at the parks with 29% aged 5-9 years, 28% aged 0-4 years, 21% aged 10-13, and 12% aged 14-18 years. The most frequently reported camping groups were couples (32%) and groups of four persons (23%). Over half of the respondents (65%) were weekend campers spending 2-4 days. Only 7% camped seven or more days during a particular visit. Over half of the respondents (64%) were tent campers, 18% used motorhomes and trailers, and 14% utilized pop-up trailers. Repeat visitors comprised 64% of those campers surveyed.

The success of any new program can in part be determined by participant awareness. Of significant interest to DNR officials was camper's knowledge of the Camp Initiatives Program prior to contact with the interviewer. Of those interviewed, only 36% were aware of the policy changes. Campers at Rocky Gap State Park were most aware of the Camp Initiatives Program. However, overall, a low level of awareness was reported by campers and can be attributed in part to delayed publicity. Information sources were analyzed to highlight potential marketing avenues. The top sources by which campers became aware of the Camp Initiatives Program included brochures (18%), friends/family (19%), newspapers (23%), and "other sources" (24%). "Other sources" included information from other persons in the local area, those at other parks, or DNR headquarters information hotline.

The new reservation system was generally well received. Sixty-four percent rated the ability to make reservations as moderately to very important and 74% rated the campsite reservation system as excellent. Most complaints about the system involved campers who were unaware of the reservation system and arrived to find all the sites "reserved." Some repeat campers were unhappy that "preferred" sites could be reserved by a select few for the entire summer or specific holidays; no

longer first come, first serve. The $2.00 reservation fee increase did not seem to displace the majority of campers. Campers at Rocky Gap State Park however, were adamantly opposed to additional fee increases.

The policy of allowing pets in four of the six pilot parks was received with mixed results. Forty percent of the campers indicated that having pets in the campground was of little to no importance; similarly, 32% felt it was moderately to very important. The majority of those adamantly opposed to pets in the campground cited noise, disturbance of wildlife, and pet waste as reasons for not allowing pets in the campground. Few problems with pets were recorded by park managers and rangers; most were site specific. Park personnel who reported conflicts noted the lack of undeveloped areas for pets, noise, failure to clean wastes from the site upon departure, and non-compliance with rules as to where pets can go within the park.

Interpretive programming in Maryland State parks has historically been the first budget area to feel the repercussions of fiscal restraint. Programs, personnel and materials/supplies are often drastically reduced or eliminated. The DNR was eager to identify the number of campers attending interpretive programs and the importance of these programs to the overall visitor experience. Only 33% of the campers interviewed attended interpretive programs. However, of the 67% that did not attend, 57% rated interpretive programs moderately to very important. This suggests a discrepancy between what campers feel is important to their experience and their actual behavior. Only 9% indicated that interpretive programs were of no importance to their camping experience. The campground programmers noted that many campers had personal itineraries often involving travel and activity outside the park. Although campers seemed enthusiastic and interested in the park programs, they chose not to attend. The most frequently attended programs in the six pilot parks were the traditional campfires (n=35), Junior Ranger programs (n=7), and those programs involving live animals (n=7).

To better understand recreational behavior in the campgrounds, campers were asked to select activities in which they participated during their camping visit. The top five activities within the park included: reading/relaxing (72%), walking/ hiking (70%), swimming (64%), fishing (55%), and picnicking (33%).

The Camp Initiatives Program was created to address declining revenue and visitation. In 1990, the total visitation for the 23 Maryland State camping parks declined 3% to just below 100,000 total sites occupied. In examining the six Camp Initiatives parks, an increase of 3.2% in total sites occupied during June-August 1990 was found. This translates to a 16% increase in revenue for the initiatives parks up from $433,699 in 1989 to $503,029 in 1990. The non-initiatives parks experienced a 2% reduction in revenue during the same time period.

A primary objective of the campground programmer was to solicit support from the surrounding community with the expectation of building a symbiotic relationship with the parks. This partnership was intended to promote not only the park, but local tourism and merchant retailers in the area. A great deal of effort was made to solicit support from businesses, restaurants, and tourist attractions in the area to provide informational brochures, coupons, or other special discounts for campers. This effort was particularly attractive at those campgrounds where campers were inclined to participate in activities in the local area. The campground programmers also promoted special in-house camping deals such as a "mid-week special," where campers would get a free night of camping if they checked in on a Tuesday or Wednesday. Other promotions included free boat rental, free pizza delivery to the campground, holiday packages (i.e., Father's Day, 4th of July celebrations), and caravan tours. While this particular aspect of the policy changes was not specifically measured by the survey, park managers, rangers and programmers provided valuable information.

Conclusions

The following recommendations are based on an analysis of interviews with campers, park rangers, and park managers. First and foremost, investment in a computerized system to oversee the reservation system appears warranted. A computerized system would drastically reduce errors presently occurring as a result of keeping the campsite reservation information in hand written ledgers. These ledgers are often handled by many personnel. The computer system could be further utilized for word processing and budget preparation. To reduce user conflict over the next few years, a percentage of sites should remain available on a first come, first serve basis for campers unaware of the new reservation system.

Campers with pets should be assigned to one specific area (i.e., a camp loop for pets), to eliminate user conflicts. Undeveloped areas in the parks should be utilized and managed for pet and owner recreation (i.e., mowed paths as opposed to developed trails), and alternative areas in the surrounding community (i.e., circuit trails, community parks/ponds that permit pets) should be offered as options for recreation.

Interpretive program resources should be allocated to traditional programs with special emphasis on children's activities. Parents enjoy one-half to one hour, active, educational programs for children. The Campground programmer position was eliminated for 1991-92 due to additional funding cuts. However, the responsibilities of this position should be absorbed by the remaining park staff. The relationship that the park builds with the community is vital to promoting the parks and increasing visitation.

In 1991, the Camp Initiatives program will include one additional park, eliminate the campground programmers position, and explore options for utilizing a centralized, privately operated reservation service. With the increase in visitation (2-10% in the Initiative parks) and revenue, as well as provision of services and facilities most important to campers, the Camp Initiatives program has been a success and will continue. This evaluation demonstrated that positive and innovative programs can help ease budgetary constraints while continuing to provide quality services for those campers wishing to utilize Maryland State park resources.

OUTDOOR RECREATION

STATE PARKS

WHAT MAKES DISSATISFIED STATE PARK CAMPERS?

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This paper reports the findings of a joint project of the University of Vermont and the Vermont Department of Forests and Parks. The goal of the project was to develop a reliable system for monitoring camper satisfaction. Camper complaints were translated into demerits based upon the rated importance of the complaint. The summation of demerits was correlated with the camper exit grade and written comments to determine the threshold of major dissatisfaction.

Introduction

LaPage and Cormier (1977) found that the public's image of an activity like camping explains to a major extent participation in that activity. In like manner, the public's image of a specific campground or park is closely associated with likely future visits to that area.

Marketing research suggests that while positive images are important to the future purchase of a product, negative images are more influential in final product choice (Echelberger and McEwen 1986). Image analysis is further complicated by the fact that the image created in the mind of a camper or park visitor may differ significantly from the image of a park manager (Clark et al. 1971).

This paper is based on the 1990 survey of Vermont state park campers. On two Wednesdays and two Saturdays in July and August 1990, all campers in all Vermont state parks were given an opportunity to fill out a "report card". This paper is based on the tabulation and analysis of these report cards. The focus of this report is on the dissatisfied camper rather than the camper who has had a satisfying experience.

Methods

LaPage and Bevins (1981) developed a "report card" for campers to register their degree of satisfaction with 12 park amenities (ease of check-in, cleanliness of restrooms, control of pets, control of noise, cost of the site, availability of firewood and supplies, recreational opportunities, rules and regulations and their enforcement, safety/security, and helpfulness of staff).

A Likert scale was used to translate report card alpha grades to a more useable numeric measurement (a = 95, b = 85, c = 75, d = 65, e = 55). The LaPage/Bevins report card has been used for the last 6 years to measure camper attitudes in Vermont State Parks. A space at the bottom of the card (2" by 4") was reserved for camper written comments.

Additionally, campers were asked to grade their first impression and their final recommendation of the park. This was, essentially, an entry/exit rating. Theoretically, if the camper had a good experience, there should be no drop in grade between entry and exit.

Campers were asked to place a check mark next to the five items on the report card which were most important to them when camping. This feature of the report card was considered critical in the separation of important from unimportant items.

Report cards were printed on 6" by 4.25" stock and were pre-addressed (postage paid) to the University of Vermont. Campers were urged to mail them in any U.S post office, rather than returning them to the ranger station.

Results

Average grades and the importance of park amenities in the minds of 1,760 Vermont State Park campers in 1990 are shown in Table 1.

Table 1. Satisfaction grades reported by 1,760 campers, 34 Vermont State Parks, 1990 (individual park means weighted by number of cards returned from campers at that park).

Item	Average Grade	Standard Deviation	Importance Votes (%)
First impression	91.05	1.57	2.18
Ease of check-in	92.02	1.44	4.70
Cleanliness of restrooms	88.11	3.76	17.99
Pet control	90.55	1.94	3.98
Noise control	89.42	2.29	12.91
Site cost	86.99	2.48	9.08
Availability of firewood	89.94	2.65	4.57
Availability of supplies	83.83	3.06	2.76
Recreation opportunities	87.04	2.76	8.80
Good rules and regulations	89.92	1.61	5.63
Enforcement of rules	89.73	2.19	6.15
Safety and security	90.66	1.72	10.62
Helpfulness of staff	92.10	1.74	10.64
Your recommendation of us	87.85	1.65	-------

On the average state park campers appeared to be quite satisfied with their camping experience in 1990. However, averages can be deceiving and lead to a sense of complacency on the part of management unless exceptions to the average are carefully evaluated. One unhappy camper will discuss his/her experience with at least 9 to 10 other campers (TARP 1976). This can potentially lead to a rightly or wrongly imposed blotch on the park image. Park management should attempt to identify the most unhappy campers, listen to their problems, and attempt to devise a method of solving complaints as quickly as possible.

Using the average of all grades on a single report card disguises an unhappy camper. There are usually enough good grades to offset a few poor grades. So the research question becomes one of developing a statistically sound procedure for identifying truly unhappy campers. A system of "demerits" was tested using only the scores assigned to the five most important elements checked on report cards (Table 2).

Table 2. Demerits assigned for report card grades of C, D, or E.

Report Card Item	Importance Vote %	Demerits Grade C Times 1	Demerits Grade D Times 2	Demerits Grade E Times 3
Clean restrooms	17.99	17.99	35.98	53.97
Noise control	12.91	12.91	25.82	38.73
Staff helpfulness	10.64	10.64	21.28	31.92
Safety/security	10.62	10.62	21.24	31.86
Site cost	9.08	9.08	18.16	27.24

Total demerits were calculated for each of the 1,760 campers in the study. The next step was to identify the threshold in total demerits where a camper was really dissatisfied with the camping experience. Two methods were employed to identify this threshold: (1) Determination of the point where exit grade (your recommendation of us) appeared to be influenced by demerits. (2) Determination of the point where strongly worded negative written comments were triggered by demerits. It seemed wise to use two methods at this point as regression analysis didn't indicate a strong relationship between total demerits and exit grade (correlation coefficient = .52, r-squared = .28).

From Table 3 it appears that where 80 or more demerits have accrued, the exit grade drops quite substantially. The exit grade does not appear to be influenced by demerits ranging between 50 and 79.

Table 3. Relationship between total demerits and exit grade.

Total Demerits	Observations	Mean Exit Grade
100 or more	12	70
80 to 99	16	75
70 to 79	8	82
60 to 69	20	84
50 to 59	22	82

The second method for determining the threshold of real dissatisfaction related to a quantification of written comments on the report card. Very detailed negative written comments were reported on 28% of the report cards that had 80 or more demerits. Similar written comments were found on only 7% of the cards with 50 to 79 demerits. This finding corroborates the relationship shown in Table 3 and indicates that the dissatisfaction threshold lies somewhere around the 80 demerit level.

The specific content of the written comments was analyzed in detail and classified. One-fourth of the comments related to cleanliness--either of restrooms, campsites, or general public areas like the beach. Another 22% of the comments related to dissatisfaction with the physical facility, either buildings or grounds. Sixteen percent of the negative comments related to the actions of fellow campers--noise, drinking, inconsiderate actions etc. Twelve percent of the negative comments concerned dissatisfaction with the on-site staff. Only 7% of the comments were directed at the cost of the camping experience. The remainder of the comments represented unique situations not easily classified.

At the onset of this project, it was hypothesized that the greatest degree of dissatisfaction would be prevalent among non-residents, and especially among campers from the more urban northeastern states. The assumption was that residents of the more urban states would be accustomed to a higher service level and want more conveniences (like hook-ups which are not available in any Vermont State Park). Data analysis found the reverse to be the case. The greatest dissatisfaction was found among the Vermont resident campers. While Vermont residents represented 26% of all campers returning report cards, they represented 63% of those who gave 50 or more demerits to the parks.

As was mentioned earlier in this paper, report cards were given to all campers on two Wednesdays and two Saturdays in July and August. Camper volume is significantly higher on weekends than on weekdays. In like manner dissatisfaction was much greater on Saturday than it was on Wednesday. More than three out of four (76%) campers giving 50 or more demerits were Saturday campers. Only 24% of the campers assigning 50 or more demerits were Wednesday campers. This finding substantiates the general feeling that degree of dissatisfaction is somewhat related to park congestion and associated problems.

Implications

Marketing surveys indicate that businesses have more dissatisfied customers than they realize (DSEF 1982). U.S. Department of Commerce data indicate that for every complaint received by management, there are an additional 26 persons who have problems, but haven't complained. Complaints will not be heard from most people unless some formal mechanism is in place through which the customer can register a complaint.

The report card mechanism serves this purpose well. However, park managers must carefully evaluate report card results. Averages can be misleading. Most campers are highly satisfied with their camping experience. This high degree of satisfaction more than offsets the low degree of satisfaction experienced by a few campers.

The demerit system employed in this research showed that a minor degree of dissatisfaction was experienced by 50 campers out of 1,760 (demerits ranging from 50 to 79). A major degree of dissatisfaction was experienced by 28 campers (80 demerits or more). This latter group represented only 2% of the respondents. On the surface this would seem to be relatively unimportant; however, if the unhappy 2% discuss this with 10 other campers, there may be as many as 20% of the public that has a rightfully or wrongfully tarnished image of a park. In the long run this could be serious.

Most of the issues cited by dissatisfied campers are controllable by management. Two thirds of the complaints related to cleanliness, facility maintenance, or the actions of other campers. Most of these issues could have been solved with very little additional expenditure.

Most of the dissatisfaction (76%) occurred on weekends. This would indicate that dissatisfaction is congestion related. Efforts by management to relieve congestion by greater dispersion or other techniques may significantly reduce the dissatisfaction level.

Management should (1) put in place a system which makes it easy for campers to register complaints, (2) develop a system of prioritizing complaints to identify critical issues, (3) attempt to solve camper complaints as quickly as possible, (4) keep a record of all complaints and the follow-up action taken by management, and (5) evaluate the long-run effectiveness of the system.

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RESIDENT PERCEPTIONS OF VERMONT STATE PARKS

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This report describes results of a survey to determine Vermont residents' opinions about their state park system. Over 400 responses were obtained from current park users and nearly 300 came from non-users. Results suggest that both day and overnight state park users are quite satisfied with the quality of services and facilities at the Vermont park they had most recently visited. Non-users also had positive feelings about the system as a whole. User fees were not felt to be a problem for users, or deterents for non-use of the parks. One very useful aspect of the study was that over 200 respondents volunteered extemporaneous comments about the park system and the survey.

Introduction

Even though open space is in short supply and has become valuable, especially in the densely populated Northeast, there are places where people can go in search of relief from urban pressures. Vermont is such a place. It is a state known for its scenic beauty, rural character, cultural heritage, and outdoor recreation opportunities. Skiing probably gets the biggest play in the press, but summer activities like camping, hiking, swimming, and boating also are popular. Spring draws fishermen to lakes and streams, and in the fall, hunters and foliage viewers bring out the "No Vacancy" signs throughout the state.

Vermont is rural in character. With 535,000 people living in the state in 1985, its density was only about 58 people per square mile. This compares with more than 100 per square mile in New Hampshire, more than 350 in New York, and more than 700 people per square mile in Massachusetts. Vermonters are proud of the state's rural character, its scenic characteristics, and opportunities available for cultural and leisure pursuits. In fact, most Vermonters believe they participate in more outdoor activities than the average U.S. citizen. They have voted with their pens and their pocketbooks to preserve the qualities that make the state an attractive place in which to live and visit.

One of Vermont's major attractions is its state park system. It offers recreation opportunities that range from the developed to the primitive. This report describes Vermont residents' opinions of the Vermont state park system.

Several studies have shown that recreationists are usually satisfied with the overall management of public recreation areas they visit (Lucas 1970; Echelberger and Moeller 1977; McDonald et al. 1987), but few studies have described the attitudes of residents of a single state (users and nonusers) toward the management of its entire park system. State park administrators need to know how all residents feel about the quantity and quality of opportunities the parks offer, the distribution of recreation opportunities within the system, and pricing policies. Administrators also need to know why some people have stopped using the system and others have never started.

Methods

Resident opinions were obtained from a mail survey that followed procedures described by Dillman (1978). A representative sample of Vermont's residents was drawn from telephone directories that cover the entire state without overlaps. Examination of several directories indicated that approximately 270 nonbusiness telephone numbers were on each page. By randomly drawing three names from each page of each directory, we were able to obtain a representative sample of Vermont residents. Telephone calls were made to 1,318 residents during November of 1986. They were asked if they had visited a state park in Vermont within the past 24 months and if they would be willing to participate in a mail survey of their opinions of the park system. The calls resulted in 1,143 residents who agreed to participate in the survey. Of these, 587 had visited a Vermont state park recently and 556 had not. Two types of surveys were mailed: one for recent park users and another for those who had not recently or had never used a Vermont state park.

Results

We received 424 usable responses from recent park visitors, a 72-percent response rate, and 278 from nonusers, a 50-percent response rate. Information obtained during the initial telephone interviews suggests that nonrespondents to the surveys were older than respondents, less likely to be state park users, and probably less active in outdoor recreation as a whole. Respondents cited August most often when describing their most recent visit to a Vermont state park. This was followed by July, September, and June. Many of those who had visited in later months also may have visited in June. The parks mentioned most often were Sandbar (a 15-minute drive from Burlington, the largest city in Vermont), New Discovery at Groton (about a 30-minute drive from either St. Johnsbury or the Barre/Montpelier areas), and Branbury State Park, just south of Middlebury.

Since 41 percent of the respondents said they had stayed less than a half day, and another 43 percent said they had stayed more than a half day but less than one day, we estimated that the average length of stay for day visits was 4 to 6 hours. Only 15 percent of the respondents said that their most recent visit included an overnight stay. The average length of stay for these 58 Vermont residents was about two nights. As the following tabulation shows, the responses indicated that more than 90 percent of these Vermonters stayed less than four nights during their most recent overnight visit to a state park:

Number of nights	Percent responding
1	28
2	38
3	26
4	5
5	2
6	2

Respondents visited the parks in many group sizes. The average group size was nearly 12 people, but this figure is somewhat inflated because of several large groups. The median as well as most prevalent group size was four people. There also

was considerable variation in the type of group. Five percent said they came alone; 49 percent were in family groups; 16 percent consisted of groups of friends; 18 percent said they were part of a group of family and friends; and 13 percent were part of an organized group, such as a church group, office, or plant party.

Most resident visitors to Vermont's state parks have been satisfied with their visits. In fact, 76 percent specifically stated this to be the case with respect to their most recent visit. Another 20 percent stated they were somewhat satisfied and only 2 percent were somewhat dissatisfied. The remaining 2 percent said they were neither satisfied nor dissatisfied. This concept of satisfaction was examined more thoroughly by asking residents about their intentions of returning to the park. More than three-quarters said it was either extremely likely or likely that they would return within a year. Another 19 percent said they probably would return; only 4 percent probably would not return. We did not explore reasons for plans not to return but believe that in some cases, reasons other than dissatisfaction with the park played a role in the responses--moving out of state, substitute opportunities, loss of transportation, lack of interest, etc.

To further quantify visitors' satisfaction or dissatisfaction with their most recent park visit, we asked respondents to grade the park they visited most recently on 11 criteria and then assign an overall grade for recommending the park (LaPage and Bevins 1981). We asked respondents to use the standards of A for excellent, B for better than average, C for average, D for below average, and E for poor. By assigning numeric values of 1 for A to 5 for E, we were able to quantify in a rough manner the perceptions of these users of the Vermont state park system (Table 1).

Table 1. Average grades given to Vermont's state parks by resident visitors based on a scale of 1 (excellent) to 5 (poor), n=224.

Criterion	Quantified Grade
Helpfulness of employees	1.9
Availability of sites	2.0
Privacy of sites	2.2
Rules and their enforcement	2.1
Control of noise	2.1
Recreation opportunities	2.2
Safety and security	2.0
Control of pets	2.1
Availability of firewood	2.3
Cleanliness of grounds	1.6
Cleanliness of restrooms	1.9
Your recommendation of the park	1.8

The grades for these criteria suggest that current users are satisfied with the quality of the Vermont state park system. This assessment agrees with one given by overnight visitors to state campgrounds in 1982.[1] However, it does not address the issue of satisfaction or lack of it from the perspective of former users who may have stopped visiting Vermont state parks for any number of reasons, or from the perspective of "potential users," those who have not yet used the parks but who may do so in the future. This is discussed elsewhere in this paper.

We also examined residents' perceptions about Vermont state parks in general using a semantic differential (Osgood et al. 1957). They were asked to describe a visit to a state park using 12 bipolar pairs of adjectives, i.e., interesting/boring, dirty/clean, work/fun, etc. Respondents were asked to express the strength of their feelings for each adjective-pair by making a checkmark on a scale between them.

For example, if a person believed that visiting a state park in Vermont was more easy than complicated, he/she would put the checkmark more toward the easy end of the scale than the complicated end. Visiting a park is perceived by recent users as interesting, refreshing, easy, clean, somewhat convenient, fun, and very safe (Fig. 1). Together, the adjective-pairs for these seven adjectives form an evaluative factor in the respondents' perception of a visit to a Vermont state park.

INTERESTING	__:X__:___:___:___	BORING
INEXPENSIVE	__:X__:___:___:___	EXPENSIVE
TIRING	X__:___:___:___:___	REFRESHING
EDUCATIONAL	__:X__:___:___:___	NOT EDUCATIONAL
EASY	X__:___:___:___:___	COMPLICATED
DIRTY	___:___:___:___:X__	CLEAN
CONVENIENT	__:X__:___:___:___	INCONVENIENT
WORK	___:___:___:___:X__	FUN
SAFE	X__:___:___:___:___	DANGEROUS
UNCROWDED	__:X__:___:___:___	CROWDED
PLEASANT	X__:___:___:___:___	UNPLEASANT
COMFORTABLE	X__:___:___:___:___	UNCOMFORTABLE

Figure 1. Semantic differential describing Vermonters' perception of visiting a Vermont state park (includes responses by users and nonusers, n=617).

Osgood et al. (1957) stated that the evaluative factor of the semantic differential is an index of attitude. Thus, Vermonters who have recently been to a park seem to have a positive attitude about their state park system. Visiting a park also was perceived as being just slightly uncrowded, very pleasant, and comfortable. Finally, Vermonters perceive visiting a state park as relatively inexpensive and only slightly educational. In fact, nonusers and past users expressed even more positive feelings about the parks than current users, though the differences were not significant.

To ascertain why nonusers stopped using the parks or why some people have never used them, we asked recipients of the nonuser survey to rate the importance of 17 reasons for nonuse on a scale of 1 (very important) to 4 (unimportant). The reason given most often by nonusers, and with the greatest amount of conviction, was that they had other things to do, such as household chores, work, etc. (Table 2). This may correlate closely with Reason 14, "Park facilities don't appeal to me anymore." A second and significant reason why people do not use the state parks is that they have closer, more convenient substitutes (which may be closely correlated with reason 6, "I prefer private (commercial) facilities." The third most frequently cited reason was "My children have grown up." This corroborates characteristics of nonrespondents to the survey--older, less likely to use the parks, and probably not as physically active as those classified as current users.

1/ Bevins, Malcolm I. 1983. Personal communication on file at Northeastern Forest Experiment Station, Burlington, Vermont.

It is interesting that most people did not believe the parks cost too much, reason 12 in Table 2. Former users and people who have never used the parks (and never intend to) believed price is even less important a reason for not using the parks than potential users. This suggests that pricing of Vermont state parks is not a major issue among Vermonters. The insignificance of prices is further confirmed by the relatively high importance that nonusers assigned to a preference for private facilities, substitutes for state park opportunities, and doing other things than visiting a state park. These reasons appear to be more important than entry or user fees.

Comparisons between park users versus nonusers revealed that users were, on average, 10 years younger and had lived in Vermont 9 years less than those who had not recently used the parks. Nonusers tend to have somewhat less education than users, but their incomes and where they were raised (urban, suburban, or rural environments) did not appear to be related to use or nonuse of the park system.

Table 2. Importance of reasons for not using Vermont's state parks based on scale of 1 (very important) to 4 (unimportant).

Reason	Potential Former User	Potential User	Potential Non-user
1. I'm not interested in using them	3.19	3.31	3.14
2. I have no means of getting to them	3.74	3.81	3.76
3. My children have grown up	2.28	3.23	3.55
4. I have health problems	3.52	3.72	3.57
5. I don't have time	2.75	2.55	3.76
6. I prefer private (commercial) facilities	3.25	3.16	2.57
7. I don't know where any state parks are	3.72	2.97	3.71
8. The parks are too far away	3.54	3.18	3.76
9. I don't like the people who use state parks	3.73	3.55	3.71
10. I have closer more convenient substitutes	2.56	3.02	2.48
11. I don't have the skills necessary for participating in park activities	3.59	3.48	3.57
12. The parks cost too much	3.67	3.31	3.81
13. I don't have anyone to go with	3.54	3.47	3.62
14. Park facilities don't appeal to me anymore	3.24	3.35	2.81
15. I wouldn't know what to do at a state park	3.71	3.48	3.76
16. I have other more important things to do (household chores, work, etc.)	2.34	1.94	2.29
17. I haven't lived in Vermont long enough to take advantage of state park facilities	3.72	3.43	3.90
Sample size	**173**	**72**	**33**

Summary and Discussion

Several reports state that as our Nation continues to urbanize, there will be increased demand for outdoor recreation trips closer to home and of shorter duration (Market Opinion Research 1986; Mill 1987; Task Force on Outdoor Resources and Opportunities 1988). State parks are uniquely situated to fulfill this demand, but park administrators should move cautiously in responding to increased urban needs. We submit that the appropriate niche for state parks generally is in the middle range of the Recreation Opportunity Spectrum (ROS) (Clark and Stankey 1979). Federal areas can and should offer experiences at the primitive end of the ROS while municipal facilities provide developed programs and opportunities. State park systems should offer recreation opportunities that touch both ends of the ROS but should tend to emphasize opportunities in the middle of it. Some state parks might provide some primitive and/or developed opportunities depending on the environmental setting of the area, history of experiences that have been offered in the past, and expectations of users.

This study showed that only 15 percent of park user respondents stayed overnight on their most recent visit to a Vermont state park, and that those visitors seldom stayed more than three nights. We cannot say whether Vermonters tend to leave the state for extended vacations or if this finding was a result of the "most recent visit" wording of the question. However, departmental records indicate that between 1986 and 1990,two-thirds of camping use at Vermont state parks was by nonresidents. Further, More et al. (1990) stated that Vermont residents do not favor subsidizing overnight users of state parks but expressed considerable support for subsidies at day-use park facilities. Perhaps the reason Vermonters do not wish to subsidize camping at Vermont state parks is that they know that most of the campers using the park system are nonresidents and/or they seldom use the system themselves for extended vacations. Further research on the issue of where Vermonters spend extended camping vacations may be useful to tourist agencies and associations.

Both day and overnight users of Vermont state parks indicate that they had very satisfactory experiences. This positive attitude toward the parks was verified by most of the current users, intentions to return in subsequent years. Nonusers had even more positive feelings than users based on the results of the evaluative factor of the semantic differential. We believe that the positive feelings of the latter may be due in part to the "aura" associated with Vermont and partly to promotional efforts by tourist agencies and associations.

We were surprised to find that of the 1,318 calls made to establish the study, 1,143 agreed to participate. Vermonters are genuinely concerned about the welfare of their park system. Nearly three-quarters of the state-park users who received questionnaires responded. There also was a 50-percent response from people who did not use the parks, and more than 200 people volunteered extemporaneous comments about the system and the survey. The following are examples of these comments.

"People want state parks. They do not want to pay for them, in either taxes or fees. While this is human nature, it is not realistic."

"You (state park administrators) are doing as fine a job as any state and better than most. Let's not lose our park system--they can never be replaced."

"More restrooms and with easier access for older and handicapped persons are needed at Ellis (State Park). There should be more recreational activities for all age groups."

"It (the survey) also brought a good discussion to the household. Vermonters do like to have a say in things that go on around them."

"Let's not bureaucratize (sic) the parks by finding ways to 'improve' them. The pressure to develop and exploit these parks

will increase with every passing year. The time will come when certain parks will have to turn away people, otherwise they will not be parks but Disneylands. Keep the parks simple and undefiled."

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MEASURING USERS' RESPONSE TO HIGHER RECREATION FEES

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One of the arguments against higher fees at publicly-provided recreational facilities is that higher fees may force low-income users to reduce their use of facilities more than high-income users, or force them to stop using the facilities altogether if they cannot afford the higher fee. Measuring the impact of higher fees on current users with different income levels is an important factor to consider when contemplating fee increases. In this paper we develop a conceptual framework that can be used to determine whether higher fees have a differential impact on current users with different income levels.

Introduction

Few topics have received more attention during the last 25 years in the field of recreation economics than recreation user fees. In 1966, Clawson and Knetsch advocated greater use of fees for resource-based recreation facilities provide by the public sector. Since 1966, numerous article have been written on the subject, describing both the advantages and disadvantages of fees for publicly-provided recreation (for example, see Harris and Driver 1987, Manning and Baker 1981, Manning et al. 1988, and Cockrell and Wellman 1985). The Reagan administration's effort to expand the use of fees at federal recreation areas during the 1980s motivated a renewed interest in the question of fees for recreation. In general, the new "federalism" of the 1980s and the large federal budget deficits both focused attention on fee levels at federal recreational facilities.

Currently, many state governments have fallen on hard fiscal times. The growth of state government that occurred in the 1980s outstripped state governments' ability to collect sufficient revenues to finance its activities now that the economy has entered a recession. In response to the fiscal problems, some states have implemented or are considering the implementation of higher fees at state parks during these tight fiscal times. Consequently, state legislators and recreation professionals are again asking themselves what is a reasonable fee to charge for state-provided recreation facilities.

One of the important issues surrounding the implementation of higher user fees at publicly-provided recreation facilities is that higher fees may affect current users with different income levels in different ways. For example, the higher fees for recreation may force low-income users to decrease their recreation participation proportionally more than high-income users. Some low-income users may stop using the facilities altogether, thereby eliminating them from the user population (Dustin 1986). On the other hand, higher fees may not have a differential impact on current users with different income levels (Cordell 1985). That is, low income users may decrease their use of the facilities in the same proportion as by high-income users, thereby suggesting that the higher fees do not have a differential impact on campers with different income levels. Clearly, the potential for differential impacts of higher fees across user groups with different income levels is of concern to recreation managers and to economists as fee increases are considered. Decisions regarding future fee levels for recreation facilities should be made with the knowledge of how the higher fees will affect different segments of the user public.

Although the literature suggests that the potential differential impact associated with fee increases is an important factor that should be considered when contemplating higher fees, we are not aware of any studies designed specifically to empirically determine whether such a differential impact exists. In fact, no conceptual framework for measuring the differential impact has be presented in the literature.

The purpose of this paper is to present a conceptual framework that can be used to test for the existence of a differential impact across income groups as fees are increased. Although no empirical results are presented, we are currently in the process of testing the framework using data obtained from campers who camped in Maine state park campgrounds during 1984.

In the next section, we present the theoretical model developed to determine whether higher fees have a differential impact on users with different income levels. We also present a discussion of a procedure that can be used to empirically estimate the theoretical model.

Theoretical Framework

The theoretical framework is based on neoclassical demand theory. For the purpose of illustration assume that the recreational activity under study is camping a state parks. Then, the consumer's utility function can be represented by:

$$U = f(C, Y)$$

where C represents the number of nights camped at state parks during the year and Y is a composite commodity representing all other goods the consumer could purchase. The objective of the consumer is to maximize utility subject to her budget constraint which is depicted as:

$$I = P_C C + P_Y Y$$

where I represents the consumer's income, P_C is the "price" of camping or the per night campsite fee and P_Y is the price of the composite good.

The constrained optimization problem of the consumer can be stated mathematically using the Lagrangian function:

$$\text{Maximize: } L = f(C, Y) + \lambda(I - P_C C - P_Y Y)$$

where λ is the lagrangian multiplier. Solving the first-order conditions for utility maximization simultaneously, one can derive the consumer's demand equation (C^*) for camping at the state park campgrounds. In implicit form, the demand for camping will depend on the income of the consumer, the campsite fee and the price of the composite good Y:

$$C^* = f(P_C, P_Y, I).$$

Once the demand curve for state park camping is obtained, it can be used to investigate the potential effects associated with changes in the fee level. The approach developed below focuses on two aspects of the demand curve. First, we are interested in how camping participation is affected by the income level of campers while holding all other factors constant. That is, we want to determine whether the number of nights of camping increases or decreases as income increases. This "income effect" is determined by taking the partial derivative of the demand equation with respect to income ($\delta C^*/\delta I$). If the partial derivative is positive, then we can conclude that camping at state park campgrounds is a normal good, and that the Engel curve for camping has a positive slope. That is, an increase in the income of the consumer will result in an increase in the number of nights camped at a constant fee level. Similarly, a positive income effect suggests that the demand curve of a high-income camper will lie above and to the right of the demand curve of a camper with a lower income, other things being equal. This situation is illustrated in Figure 1, where D_L and D_H represent the demand curves of a low-income and high-income camper, respectively.

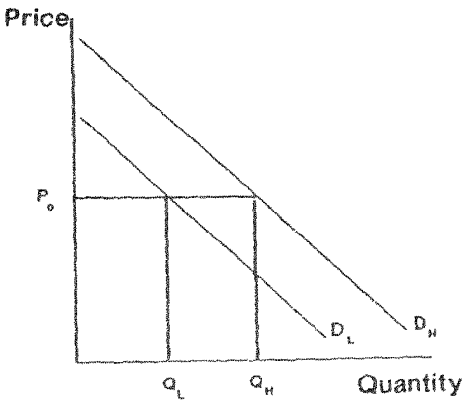

Figure 1. The relationship between the demand curves of high and low-income campers when the income effect is positive.

On the other hand, if $\delta C^*/\delta I$ is negative, then camping at state parks is an inferior good and the Engel curve for camping has a negative slope. In other words, at a given fee level, campers will camp fewer nights as their income increases. The negative income effect also signifies that the demand curve of the low-income camper will lie above and to the right of the demand curve of a high-income camper, other things being equal. This situation is illustrated in Figure 2.

Measuring the income effect associated with camping is important when considering differential impacts because differences in the number of nights camped by different campers can be caused in part by differences in the income of the campers. In other words, the income effect determines the relative position of the demand curves of campers with different income levels. If the income effect is positive, the demand curve for people with high incomes will lie above and to the right of the demand curve for low-income campers, other things being equal. Conversely, if the income effect is negative, the

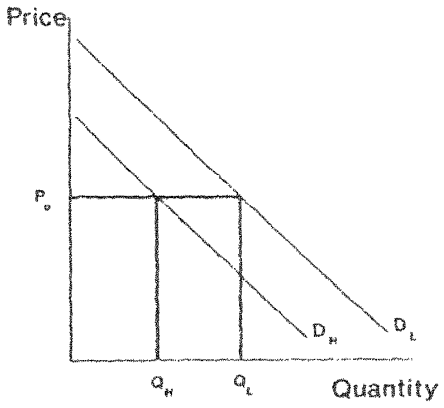

Figure 2. The relationship between the demand curves of high and low-income campers when the income effect is negative.

demand curve of low-income campers will lie above and to the right of the demand curve of campers with higher incomes, other things being equal.

The second aspect of the demand curve that is important when measuring the effects of higher fees is the "own-price effect". The own-price effect is measured by taking the partial derivative of the demand function with respect to the camping fee: ($\delta C^*/\delta P_C$). The own-price effect is the inverse of the slope of the demand curve. We know that $\delta C^*/\delta P_C$ is negative since demand curves are almost always downward sloping. However, the magnitude of the own-price effect may differ for people with different levels of income, which means that their demand curves will have different slopes. In fact, if higher fees have a differential impact across income groups the demand curves of campers with different incomes must have different slopes. Specifically, the demand curve for high income campers should be more inelastic (have a steeper slope) than the demand curve for low-income campers. This situation is shown in Figure 3. The steeper demand curve for high-income campers indicates that changes in their camping activities are less responsive to a change in camping fees than are the camping activities of low-income campers who have a flatter demand curve. For example, if the camping fee increases from P_o to P_1 as illustrated in the Figure, the camping activity of the high-income camper will decrease from Q_o to Q_H, while the camping activity of the low-income camper will decrease from Q_o to Q_L. Clearly, the fee increase causes a greater reduction in the camping activity of the low-income camper than the high-income camper. This type of differential effect would represent an adverse differential impact across income groups in that low-income campers would reduce their camping activity more than high-income camper and may stop camping at the facility altogether.

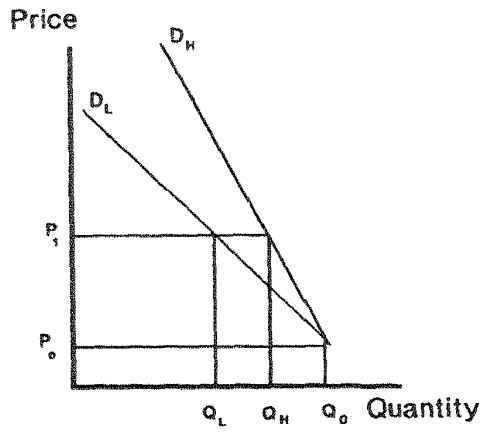

Figure 3. Demand curves illustrating differential impact on campers with different levels of income as fees are increased.

Empirical Considerations

An empirical test of the existence of differential impacts can be performed by estimating a demand curve for the recreation facility that includes an interaction term between the fee level and income. Assume that the following demand curve is estimated:

$$C^* = b_0 + b_1 P_C + b_2 I + b_3 (I * P_C)$$

Where $b_0 \gtrless 0$

$b_1 < 0$

$b_2 \gtrless 0$

$b_3 \gtrless 0$

Given this specification, the income effect defined above is:

$$\delta C^* / \delta I = b_2 + b_3 P_C$$

Clearly, if b_2 and b_3 are both statistically significant and positive, then the income effect is positive and the demand curve of high-income campers will lie above and to the right of the demand curve of low-income campers, ceteris paribus. Similarly, if b_2 and b_3 are both statistically significant and negative, then the income effect is negative and the demand curve of low-income campers will lie above and to the right of the demand curve of high-income campers. If b_2 and b_3 are both significant but have different signs, the income effect will be positive for some fee levels and negative for other fee levels. Finally, if both b_2 and b_3 are both statistically insignificant, the income effect is zero and the demand curves of the low and high-income campers would be the same, other things being equal.

The own-price effect for the demand function with an interaction term between price and income is:

$$\delta C^* / \delta P_C = b_1 + b_3 I$$

As noted above, b_1 is negative; however, the magnitude of the own-price effect also depends on the sign and magnitude of b_3. If b_3 is positive, then the own-price effect will become smaller as income increases. That is, the reduction in camping activity associated with an increase in camping fees will be smaller for high-income campers than for low-income campers. Since this corresponds to the adverse differential impact described above, the adverse differential impact exists if the estimated coefficient b_3 is positive in the estimated demand equation.

If b_3 is negative and statistically significant, the own-price effect will be larger for high-income campers than for low-income campers. That is, high-income campers decrease their camping activity more that low-income campers in response to a fee increase, other things being equal. Although this would also represent a differential impact, it is not considered to be an adverse impact since high-income campers' greater response to higher fees does not reflect an inability to pay the higher fee. Finally, if b_3 is not statistically different from zero, the own-price effect is the same over all campers, regardless of their income level, and no differential impact exists across income groups.

The theoretical and empirical framework outlined above can be tested by estimating the demand curve for a recreational activity that includes an interaction term between income and the campsite fee. The interaction term is required to allow the income effect to vary with the fee level. It is also required to allow the own-price effect to vary with the income level of campers. Since the differential impact across income groups implies that the own-price effect associated with higher fees must differ for campers with different levels of income, the interaction term must be included in the demand equation.

Preliminary empirical work has been completed using the procedures outlined above. Data from people who camped in Maine state parks campgrounds during 1984 are being used to estimate both resident and nonresident demand curves for Maine state park camping. The preliminary work suggests that a differential impact may, in fact, exist as camping fees are increased. However, additional work must be performed before these results are presented.

Summary and Conclusions

The purpose of this paper was to develop a theoretical framework and empirical procedure that could be used determine whether higher fees at recreational facilities create differential impacts across income groups of current users. The procedure developed focuses on measuring the income effect and own-price effect derived from the estimated demand curve for the facility. Since a differential impact across income groups implies that the slopes of the demand curves of high and low-income users must be unequal, an interaction term between income and the campsite fee must be included in the estimated demand equation. Adverse differential impacts exist if the coefficient on the interaction term is positive and statistically significant.

Preliminary estimates using data obtained from Maine state park campers suggest that adverse differential impacts may, in fact, exist at higher camping fees. However additional empirical would is required before the results are presented.

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ECONOMIC EFFECTS OF STATE PARK RECREATION IN PENNSYLVANIA

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The economic effects resulting from the use and operation of Pennsylvania's state park system were analyzed with an input-output model of the state's economy. Direct expenditures by park users and park operations were estimated at $263 million for the 1987 study year. Secondary effects, stemming from interindustry trade and recreation-related employment, provided an additional $299 million in total sales.

Introduction

The current attention placed upon travel and tourism as a source of economic development parallels the increasing importance of service industries within the U. S. economy. Our nation's dependence on educational, financial, healthcare, housing, and recreational services was underscored during the 1986-1989 period, when over half of the gross national product was attributed to the consumption of these services (U.S. Bureau of Economic Analysis 1989).

Documenting the total value of recreation-related expenditures is a difficult assignment. Existing measures of output from such sectors as lodging and food services do not differentiate recreation from business-related trade. Similar problems arise when attempting to measure recreation-related expenditures within the transportation, retail, and manufacturing sectors.

Improved estimates of recreational expenditures have been obtained from studies addressing the actual consumption patterns of particular user groups (Mittleider and Leitch 1984, Donnelly and Nelson 1986). These investigations have typically involved direct survey methods to identify the expenditure and demographic characteristics of various user groups. As a further extension of this work, recreational expenditures have been entered into regional input-output models to determine the subsequent value of interindustry trade generated by the initial expenditures and the added household consumption originating from recreation-supported employment (Alward and Lofting 1985, Fritschen 1989).

In an effort to measure the financial effects of state park recreation within Pennsylvania's economy, a cooperative research effort was initiated between the Pennsylvania Department of Environmental Resources and Penn State's School of Forest Resources. Two basic objectives were involved: (1) to determine the expenditure and demographic characteristics of state park users and (2) to evaluate the total economic effects of park-related expenditures within the state's economy. An earlier paper presented the details of the survey methodology and the expenditure profiles of state park users (Strauss and Lord 1990). The following paper focuses on the demographics of park users and the total economic effects of park-related expenditures within the state.

The State Park Setting

Pennsylvania's state park system includes 114 parks and is distributed uniformly throughout the Commonwealth. The size and distribution are credited to the early history of state park development, coupled with a general state mandate to provide increased public access to recreational areas (Forrey 1984). Over the past three decades, a combination of state and federal funds was used to more than double the size of the state park system.

Operational costs have also increased, with $36 million required in 1987 to operate and maintain the system. Renovation of many of the older parks, coupled with the first cycle of major maintenance in the relatively newer parks has placed an increased cost burden on the overall system.

State parks also serve an economic purpose within their immediate regions through the employ of local resources and the generation of expenditures by park users. This particular attribute of state parks is poorly defined and has received little attention in the past. In an effort to correct this oversight and to identify the financial role of state parks within Pennsylvania's economy, the following project was established with Penn State's School of Forest Resources.

Procedures

The initial stage of research was directed to obtaining information on the expenditures and demographics of park users. A controlled sampling design was used in conducting over 7000 visitor interviews at 30 state parks during the 1985, 1986, and 1987 summer seasons. Park audiences were stratified on the basis of six major activities: camping, picnicking, swimming, fishing, boating, and hiking. Typically, these activities attract over 80 percent of annual park attendance on a statewide basis. Details on the study procedures and expenditures patterns of various activity groups were previously reported (Strauss and Lord 1990). The second stage of work, initiated in 1989, analyzed the economic effects of park-related expenditures within Pennsylvania for the 1987 study year.

The economic effect of park user and agency expenditures was analyzed with a computerized, input-output model of the state's economy. The Pennsylvania model was generated from the Impact Analysis for Planning (IMPLAN) System, organized by the USDA Forest Service for the national economy (USDA Forest Service 1985). The Pennsylvania IMPLAN model identified the network of trade relationships between business, government, and household sectors. More than 500 individual sectors are described in terms of production, employment, and the between the sectors. IMPLAN also enumerates the economic functions necessary for balancing production, consumption, and the import and export of goods and services during a given period. On the downside, the model is dependent on 1982 data, with many of the state's production and trade relationships based on national averages for the same period.

In using the IMPLAN model, user and state expenditures were deflated to 1982-equivalent values and entered as direct payments to the primary sectors receiving this money. Since the park system largely serves a resident population and with Pennsylvania representing a major-sized geographic region, the analysis of economic impacts, or effects, was not limited to the inflow of nonresident expenditures. Rather, the analysis considered all in-state expenditures made by the total park audience and the agency itself in estimating the subsequent cycles of secondary effects resulting from these payments.

Secondary effects included the indirect business trade from sectors providing inputs to the primary sectors and the related chain of interindustry trade generated by this process. Additional secondary effects were identified in terms of the consumer expenditures induced by the salaries and wages earned from the direct and indirect business activities. All secondary effects were inflated back to 1987-equivalent values.

Results

Demographics of State Parks Users

State park users were characteristically young, family-oriented people with moderate-level incomes. Their average age was 32 years. Fifty-five percent were male and 45 percent female, with nearly 60 percent of the park usage identified with family groups. Average annual family income approached $28,000.

Age distributions indicated that nearly one fourth of the park users were under 15 years old (Figure 1). Another 9 percent were teenagers in the 15- to 19-year class. Persons 20 to 39 years of age represented over one-third of the total audience. Middle-aged persons, 40 to 59 years of age, represented 22 percent of park use, with persons over 60 years contributing 9 percent of use.

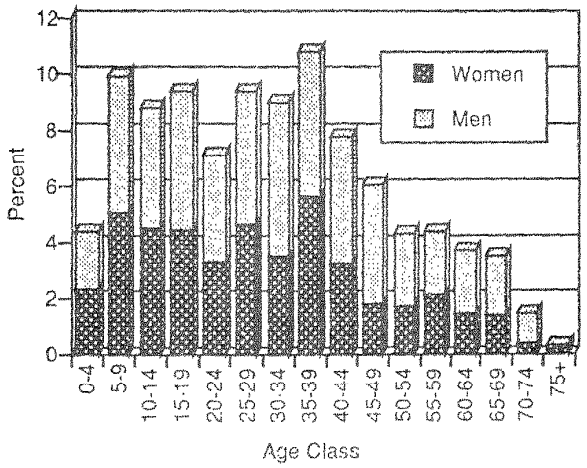

Figure 1. Distribution of state park users by age and gender.

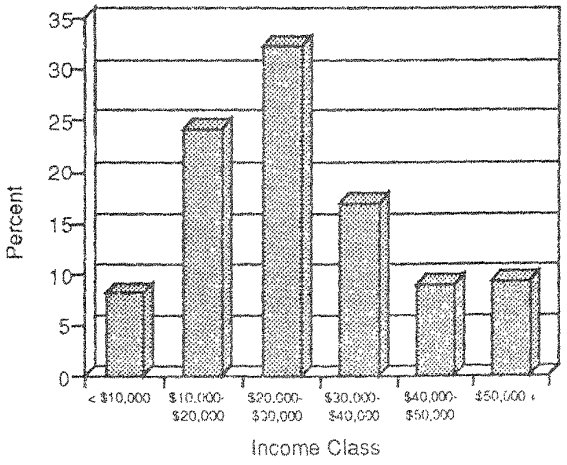

Figure 2. Distribution of respondents by family income.

Park usage was greatest among low- to moderate-income families, with 65 percent of the attendance tied to individuals having annual family incomes under $30,000 (Figure 2). Twenty-six percent of the park users were in the family income brackets of $30,000 to $50,000 per year.

Forty percent of those interviewed had post-high school educations, with another 56 percent having high school or technical school degrees. Paralleling these results, 35 percent of the respondents were employed in blue collar occupations, with nearly the same percentage employed in white collar jobs. Fifteen percent of those interviewed were retired.

Day use activities provided the major recreational focus at state parks during 1987. In total, day use activities accounted for 95 percent of annual attendance, with picnicking, swimming, and hiking representing the more popular recreational pursuits (Strauss and Lord 1990).

Most park users lived near the parks where they were interviewed. One-fourth of the users were within a 20-minute drive of the park and over three-quarters were within 40 minutes of the park. Twenty percent of the audience traveled over an hour to reach their park destinations.

User Expenditures

Activity costs included the specific charges for activity-related items and the prorated costs of equipment and such general expenses as food, lodging, and travel. Equipment costs represented the major recreational items purchased over the past year and used at a state park location. These expenditures were proportioned specific to state park usage and averaged among all park users. General recreational expenses were also prorated in terms of the time spent in state parks and in particular activities. Costs were identified on an activity day basis, representing an individual's cost of pursuing a given activity over some portion of a day's visit.

The six activities fell into two cost ranges (Figure 3). Swimming, hiking, picnicking, and fishing were in a moderate cost range, averaging $5 to $9 per activity day. Over 85 percent of these expenditures were directed to general and activity-related items, with less than 15 percent involved in equipment. Camping and boating were more expensive, averaging $20 and $26, respectively, per activity day. Most of their increase was for equipment costs.

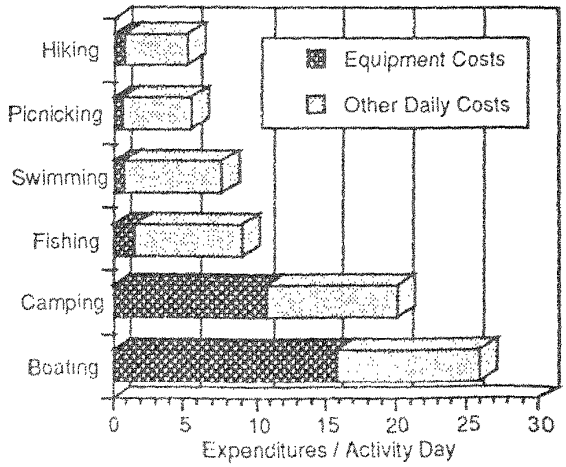

Figure 3. Expenditures per activity day by activity.

Total Expenditures

Total user expenditures were developed by multiplying the average activity costs by respective annual attendances and summing over all parks and all activities. Expenditures for non-surveyed activities were estimated from auxiliary studies. Total user expenditures for the 1987 calendar year were estimated at $250 million.

Food and food-related services were the largest cost item, amounting to 32 percent of total user expenditures. Equipment purchases nearly matched food costs, for another 32 percent of the total. Transportation costs, measured on the basis of fuel purchases and minor vehicle repairs, accounted for 14 percent of the total. Activity-related items, involving expendable recreational supplies and fuel for boating and fishing, constituted another 9 percent of the total. Lodging and incidental trip costs were the final 13 percent of expenditures.

The cost of operating, maintaining, and developing state parks during 1987 was obtained from Department of Environmental Resources records. Total expenditures from all sources amounted to $36 million, with 95 percent used in the operation and maintenance of existing park facilities and the remainder directed to the construction of new facilities. On the basis of key inputs, 65 percent of the expenditures went to the employ of state personnel, 19 percent to contract services, and 16 percent for park supplies and utilities.

Economic Effects to Pennsylvania

The economic effect of state park recreation within Pennsylvania, as determined from IMPLAN model analysis, was $562 million in total sales. This included in-state expenditures of $263 million from park users and park operations and secondary demands of $299 million from interindustry trade and recreation-based employment (Table 1).

In-state expenditures by park users were $241 million, and for park operations, $22 million.

Principal sectors receiving the $263 million in direct expenditures were manufacturing (41 percent), service industries (27 percent), and wholesale and retail trades (21 percent) (Table 1). Most of the manufacturing sales was tied to recreational equipment and apparel, food products, and transportation fuels. Service industries benefited from the trade realized in food services, lodging, and associated recreational services (e.g. photo processing). The wholesale and retail sector participated in the direct expenditures process on the basis of retail food and recreational product sales.

As a result of the direct expenditures, secondary effects were generated through inter-industry trade and employment-based demands in the amount of $299 million. The major sectors participating in these secondary effects were manufacturing (25 percent of secondary sales); finance, insurance, and real estate (24 percent); and service industries (24 percent) (Table 1). Manufacturing again played a prominent role on the basis of goods sold to other production sectors and to the household sector. Finance, insurance, and real estate participated in the secondary process through the banking services and real estate sales provided to the household and business sectors. Secondary demands within the service sector included health care, food services, and other domestic services.

The $562 million in total sales showed a value added to production of $262 million (Table 1). Value added represented the amount of total sales directed to wages and salaries, interest payments, taxes, d epreciation, and profit. Sectors with a high ratio of value added to total sales were typically labor-intensive and service-oriented industries. These included wholesale and retail trades, the finance, insurance and real estate group, and the service industries. Two social measures of this economic process were the employment income and the number of jobs originating from total sales. Nearly 27 percent of total sales was directed to employment income, amounting to $154 million (Table 1). In turn, almost 10,000 jobs were credited to this recreation-based demand. Sectors having the highest levels of employee income and jobs were the service industries, manufacturing, and wholesale and retail trades. Further employment was also credited to the Bureau of State Parks in terms of 640 full-time positions and 950 seasonal jobs, representing an annual equivalent of nearly 880 positions within the agency.

Table 1. Economic effects of state park recreation in Pennsylvania.

Sectors	Direct Sales	Second Sales	Total Sales
	($ millions)		
Agriculture	2.5	13.2	15.7
Construction	1.9	10.9	12.8
Manufacturing	108.0	75.3	183.3
Transport. Commun. and Utilities	6.9	29.0	35.9
Wls. & Rtl.Trade	54.2	19.8	74.0
Fin., Ins. and R. Est.	3.9	72.9	76.8
Services	71.8	71.8	143.6
Government	13.7	5.1	18.8
Other Sectors	.0	.8	.8
Total	262	9 298.8	561.7

	Value Added	Employee Income	Employ
	($ millions)		(jobs)
Agriculture	4.4	1.4	223
Construction	5.8	5.3	175
Manufacturing	47.6	38.5	1,693
Transport. Commun. and Utilities	13.6	8.1	256
Wls. & Rtl. Trade	52.9	33.7	3,634
Fin., Ins. and R. Est.	54.8	11.2	487
Services	74.7	50.2	3,220
Government	8.0	5.5	282
Other Sectors	.6	.4	28
Total	262.4	154.3	9,998

Discussion

Although outdoor recreation is often characterized as a cyclical and largely service-oriented industry, the IMPLAN analysis of park-related expenditures showed a broader economic involvement with a composite of industrial sectors. Nearly 41 percent of the direct expenditures went to the manufacturing sector, with 27 percent channeled to the service industries sector and another 21 percent to wholesale and retail trades. Secondary effects of these direct expenditures showed a further involvement with the manufacturing, financial, and service sectors.

Overall, park-related expenditures created a wide array of economic benefits on a sector-by-sector basis and, in all probability, represented an economic process not confined to any particular season. Results from this study suggest that the business process may involve substantial lead time in preparing for this recreational market and may also create certain lagged effects in terms of secondary expenditures. For example, although 76 percent of the direct expenditures was associated with the "summer recreational season", nearly 30 percent of this amount was for equipment purchased over the previous year. In addition, food products, recreational equipment, and apparel would require a certain lead time in their manufacture and distribution. Finally, the secondary effects realized by other supporting industries and from induced consumer demands would involve a continuing span of time.

Summary

Implications to Park Management

State park users are largely a family-oriented audience, have moderate-level incomes, and live within close proximity of state parks. Most of their recreational expenditures were tied to food and food services, recreational equipment, and transportation. In turn, these monies were channeled into the manufacturing industries, the service sector and the wholesale and retail trades. All told, expenditures tied to the use and operation of state parks resulted in total economic effects of $562 million within the state. Total industrial employment attributed to park expenditures represented 10,000 industrial jobs and an additional 880 positions within the Bureau of State Parks.

These economic results can be largely credited to the statewide system of 114 parks, with the operation and maintenance of the system representing a certain catalyst to the overall process. During 1987, the $36 million in park operations led to a fifteen-fold increase in economic activity throughout the state. Pennsylvania's park system is an established recreational entity that provides three basic types of benefits to our society. First, they meet the recreational needs of the public in terms of a diverse set of activities and park locations. Second, they represent ecological reserves that contribute to the maintenance of a healthy environment. Third, they support a substantial volume of economic activity. The challenge presented to park management is sustaining this unique set of natural resources for future generations while continuing to meet the public need for recreational opportunities. As an ancillary feature of this system, the public's pursuit of outdoor recreation will continue to contribute to our state's economy.

Acknowledgement

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IMPACT OF USER FEES ON DAY USE ATTENDANCE AT NEW HAMPSHIRE STATE PARKS

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This paper examines state park day use attendance data over a ten year period, 1980 - 1990, for variations in attendance effected by increases in user fees. A non-controllable variable the weather has been taken into account. The results of this paper suggest that user fees can be successfully collected at specific locations and provide positive income without significantly decreasing attendance.

Introduction

The changing economy and public opposition to new or additional taxes is forcing many public recreational agencies to investigate the feasibility and impact of user fees for public property. New Hampshire State Parks have successfully collected user fees at many locations and have historically recovered up to one hundred percent and more of their operating expense. The purpose of this study is to examine existing state park data for variations in attendance relative to increased user fees at New Hampshire state beaches, day-use areas, and historic sites over a ten year period.

Study Areas

For the purpose of the study 27 state parks were categorized into three types; beaches, day-use areas, and historic sites. User fees are charged at all of the parks chosen in each category. The three categories are described as follows:

Beaches

New Hampshire state beaches made up the largest percentage of the properties in this study. There are 16 swimming beaches in the state park system. Two of these are large salt water beaches and are extremely popular among day-trippers and residential tourists during summer months. The other 14 in-land beaches are smaller and located on various N.H. lakes and ponds.

Day-Use

Six day-use parks were studied. These areas are typically mountain areas and offer such recreational opportunities as hiking, picnicking, and sight-seeing.

Historic Sites

New Hampshire state historic sites made up the smallest percentage of the parks studied. Although there are only five state historic sites they are important cultural assets to the state park system. These sites include: the Robert Frost Farm, the John Weeks Estate, the Daniel Webster Birthplace, the Franklin Pierce Homestead, and the Wentworth-Coolidge Mansion.

Findings

Beaches

During the study period of 1980 to 1990 there were four fee increases at New Hampshire state beaches(table 1). User fees gradually increased from $.75 per person in 1980 to $2.00 in 1984. The $2.00 user fee remained constant from 1984 to 1989. During 1990 the fee was increased by $.50 to $2.50 per person on weekends and holidays.

Table 1. Beach attendance and user fees, 1980-1990.

Year	Attendance	Fee $
1980	1,011,200	.75
1981	865,600	1.00
1982	804,700	1.50
1983	1,035,100	1.50
1984	870,600	2.00
1985	986,000	2.00
1986	897,000	2.00
1987	754,300	2.00
1988	866,800	2.00
1989	770,600	2.00
1990	736,500	2.00

Overall, beach attendance shows a general decline between 1984 and 1990 even though user fees remain constant from 1984 thru 1989 (Fig. 1). The fluctuation in attendance during the study period suggests that fee increases are not the sole variable impacting beach attendance as there are increases and decreases in attendance that do not coincide with fee increases. Other variables considered were precipitation (Fig. 2) and temperature.

1980 had the second highest attendance during the study period with the lowest user fee, moderate rain and high temperatures. Though there were considerable fee increases, 33% in 1981 and 50% in 1982, the weather was less than desirable with 11.6" of rain and cooler temperatures in 1981 and the same for 1982 with more than 13.2" of rain. Overall beach attendance declined from 1980 to 1982. 1983 was the driest year of the study period with 6.76 inches of rain along with being one of the warmest and had the highest attendance of any year from 1980 to 1990. User fees increased from $1.50 to $2.00 in 1984 and remained constant through 1989, however park attendance did not. 1984 saw attendance slightly higher than 1981 with a similar temperature and 3" less rain. A 13% increase in attendance was noted in 1985 over 1984 with very similar weather conditions.

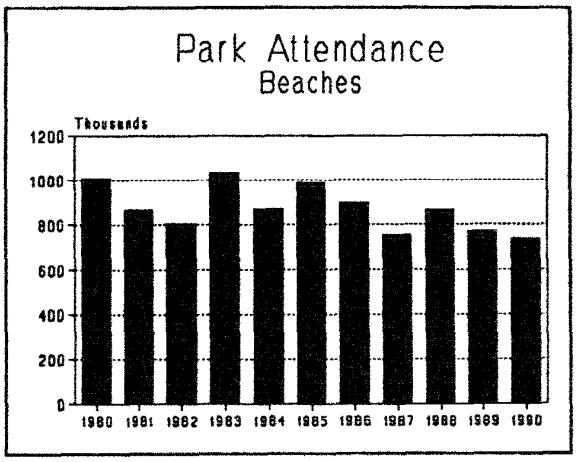

Figure 1. Annual park attendance at beaches.

Precipitation in the years 1986 through 1990 was quite high ranging from 11.42" to 13.44". Temperature and precipitation appeared to be the deciding factors for beach patrons.

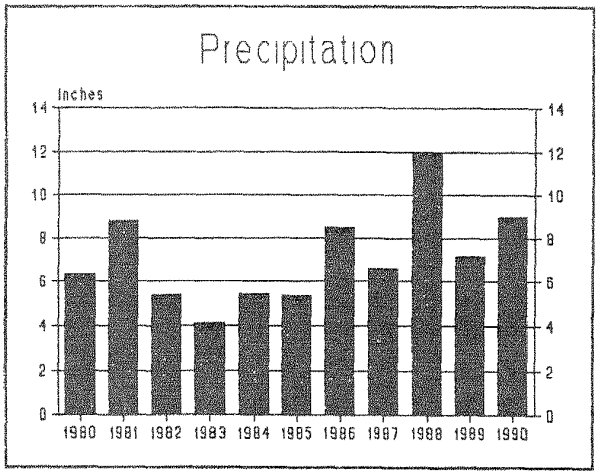

Figure 2. Average annual precipitation.

Day Use

Day use areas experienced three fee increases during the study period of 1980 to 1990. During 1980 and 1981 the user fee was fifty cents per person. The fees was increased to $1.00 per person in 1982 and remained constant until 1988 when it was increased 100% to $2.00 and unified the fee structure through out the park system. The last increase occurred in 1990 when fees were raised to $2.50 per person on weekends(Table 2).

Table 2. Day-Use Attendance and User Fees, 1980-1990.

Year	Attendance	Fee $
1980	143,700	.50
1981	137,600	.50
1982	130,700	1.00
1983	132,600	1.00
1984	139,000	1.00
1985	131,500	1.00
1986	133,500	1.00
1987	137,900	1.00
1988	156,800	1.00
1989	175,600	2.00
1990	127,700	2.00

Overall, day-use attendance has remained relatively constant during the study period (Figure 3). In 1982 the fee increase appears to have had an impact as attendance fell more than 5% from 1981 with similar rain fall (Figure 4) but a cooler temperature. Attendance at day use areas recovered during 1983 through 1985 while rain fall was down, temperatures were up and the fee was constant. In 1986 total precipitation for the summer increased sharply and remained up through 1990. Attendance increased constantly from 1986 to 1989 with a substantial increase, 12.1%, coinciding with a doubling of the fee to $2.00 in 1989. 1990 experienced a 37.8% decrease in attendance while the only significant variable change was the 50 cent fee increase on weekends.

Historic Sites

During 1980 and 1981 operating seasons user fees at state historic sites were fifty cents per person. Fees were increased to $1.00 per person in 1982 and $2.00 in 1984. From 1984 to 1990 the fee remained constant (Table 3).

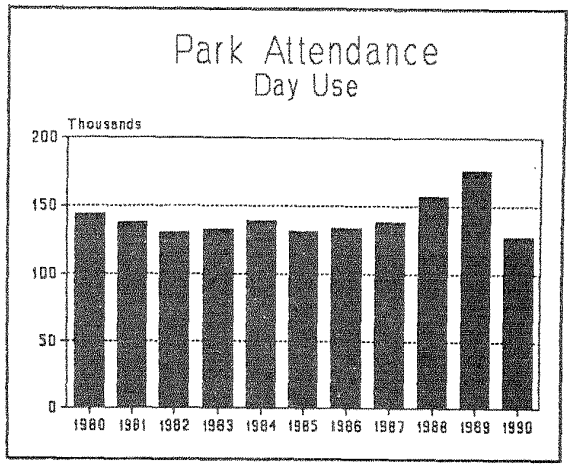

Figure 3. Annual park attendance at day use areas.

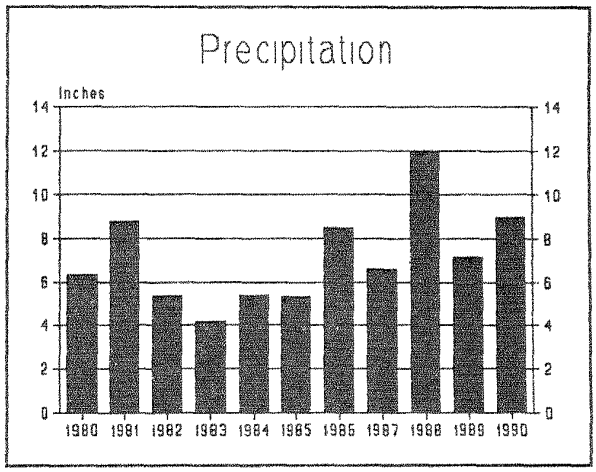

Figure 4. Average annual precipitation.

Table 3. Historic site attendance and user fees, 1980-1990.

Year	Attendance	Fee $
1980	10,392	.50
1981	4,816	.50
1982	5,752	1.00
1983	8,600	1.00
1984	9,100	2.00
1985	12,300	2.00
1986	10,600	2.00
1987	10,500	2.00
1988	13,600	2.00
1989	10,600	2.00
1990	11,200	2.00

During the study period attendance at NH state historic sites demonstrated a steady increase in attendance even though there were two fee increases (Fig. 5). When compared to the weather it becomes apparent that historic sites may do better when outside activities are limited due to rain (Fig. 6) as years of high attendance correlate to years of higher rainfall.

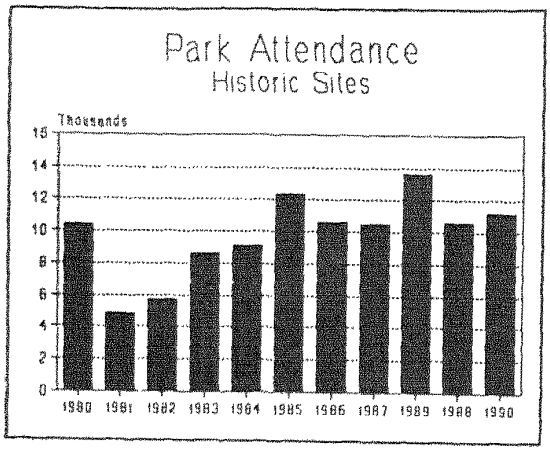

Figure 5. Annual attendance at historic sites.

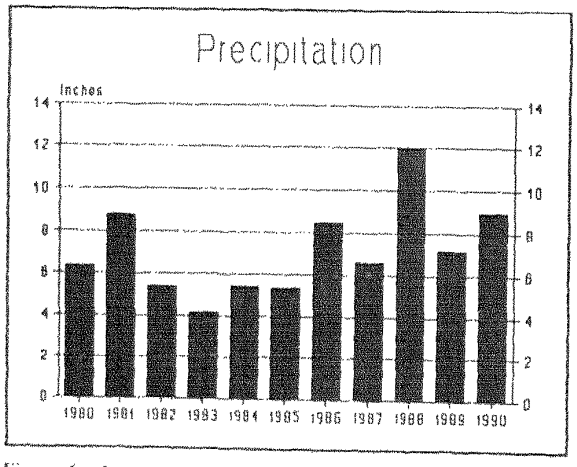

Figure 6. Average annual precipitation.

Overall Attendance

Overall there was a decline in park attendance during the study period of 1980-1990 but 87% of all patrons visit beaches which appear to be weather dependent more than price dependent. Historic sites appear to be unaffected by user fees and unlike beaches do well when the weather is inclement. Day use areas appear immune to the effects of either weather or increased user fees at these levels.

Summary

The results of this study suggest that park visitation is influenced to a great degree by the weather and to a much lessor degree if at all by user fees of up to $2.00 per person. It is important to mention that there have not been any written complaints received relative to user fees during periods of increase. The results of this study further suggest that user fees can be can be implemented over a period of time and used to generate income to offset operating expenses with out significantly impacting visitation levels.

OUTDOOR RECREATION

MANAGEMENT OF RECREATION RESOURCES

COUNTING VISITORS AT NATIONAL PARKS: CONCEPTS AND ISSUES

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Unless attendance is treated as a multidimensional concept, it can mislead a manager as to what is happening in his park. The Canadian Parks Service recently revised its attendance measures so that they can provide both meaningful information about individual parks and be used consistently in all parks.

1. The History of Attendance in the Canadian Parks Service

In the sixties and early seventies, many myths grew up around attendance reporting in the national parks of Canada. Some park managers firmly believed that budget allocations for their parks depended in some direct and rational way on levels of attendance. Some managers believed that their positions depended on attendance levels. There was also a widely held organizational view that it was important that attendance be increasing from year to year, even if one was not sure exactly what attendance was. On the other hand, some managers diligently sought an accurate measure for attendance in the belief that it could tell them something useful, even indispensable, about their operations, and in particular, workload.

Of course, the number of visitors has something to do with workload in a park. It is almost axiomatic, and like a lot of axioms, we do not often think much about it. If a park offers services to visitors or tries to influence their behaviour (e.g., tries to keep them from destroying the resource), then more visitors means more serving and more influencing. However, number of visitors has a very complex (and poorly understood) relationship with workload. And that relationship varies from place to place and from time to time. Where things are complex, not well understood, and surrounded by myth, you would expect a lot of confusion, and a diversity of approaches. Not surprisingly, therefore, there were a lot of different things being reported as park attendance across the system of parks.

In the mid-seventies, the "socio-economic" group at the Canadian Parks Service headquarters was charged with the task of putting some order into attendance counting and reporting. We took our mandate seriously, and tried to find and correct arbitrary and unsound definitions and ad hoc and unstable counting methods. Our aim was to transform attendance measures with little or no management utility into new reporting formulas so that attendance figures would show us what was going on in parks, or at least would signal events that required management attention.

While trying to untangle the confusion, we recognized that visitors do not all impact workload the same way in every circumstance. We came to understand that different parks were going to need different attendance measures: there was no one best way to do the job. For the same reasons, we also recognized that attendance was not necessarily a useful measure at all parks. Still, for political reasons, it was necessary to count attendance everywhere. Can you imagine a park manager not being in a position to answer the question "How many people visit your park?"

As a result, in some parks we had ways of counting attendance that measured nothing other than entering traffic. In some cases, we measured party nights of camping, and in other cases, we measured entries for the purpose of visiting the park and using the services provided. The reason for this variety is that in some parks, the primary workload is related to pass through traffic. Attendance that does not include pass-through traffic (even though these people can only loosely be called visitors) does not reflect true park workload. In other parks, virtually everyone who comes to the park spends time overnight camping. Party-nights of camping is therefore a good measure of the park's workload. In some parks, there is a mix of day-users, campers, sightseers, and some pass-through traffic. The best solution here seemed to be to identify, through surveys, those persons who enter the park and make some use of it consistent with our primary mandate of heritage appreciation and recreation and calibrate their proportions against some easily recorded measure.

It is important to recognize that attendance has not been the only statistic reported by the Canadian Parks Service. Since 1971, a variety of use statistics, reflecting day to day operations, have been recorded by the parks. For example, if you wanted to know if camping in a park was increasing, you did not look at attendance, you looked at the camping statistics. If you wanted to know if vehicle entries to a park were increasing, you looked at vehicle entry figures by gate. If you wanted to know what was happening in interpretive programs, there were interpretive program utilization statistics.

2. The Search for Consistency

We did not, however, live happily ever after. After over ten blissful years of relatively satisfactory attendance reporting, a new force arrived on the scene: the Auditor General of the Canadian Parliament. In 1983, a comprehensive audit was conducted of the Canadian Parks Service. The Socio-Economic function, of course, was one of the groups whose activities were reviewed. Where we saw healthy and useful diversity in attendance reporting, the Auditor General's team saw inconsistency and cross-purposes. They looked at the attendance calculating formulas for different parks and saw that different things were being measured. Therefore, according to them, no overall measure of attendance was possible, so that what we had been reporting nationally as attendance was erroneous and misleading.

Attendance formulas were being used consistently from year to year at individual parks, and more and more parks had attendance figures that had value to park management. However, this was not enough to make the attendance measures acceptable to the auditors. The fact that attendance was virtually defined as pass through traffic in some cases, as campers in another, and as something else in other cases was viewed as inconsistent. There is no denying it, it was inconsistent! To be fair however, the Auditor General was looking for something quite different from what we had been aiming for. The Auditor General's Office wanted a "performance indicator" for the whole of the Canadian Parks Service, a single number used consistently at over 100 parks and historic sites which could be used to indicate to the

Canadian Parliament how the Service was performing. We, on the other hand, were trying to find measures in each park and historic site that would indicate to individual park managers something about how their individual parks were doing. So the problem was not a question of inconsistent attendance measures, but of inconsistent objectives.

Of course, the search for the single number to describe performance is an activity surrounded by at least as many myths as once surrounded attendance measurement. In fact, it is somewhat akin to the search for the holy grail: the biggest myth is that it exists at all. If attendance is to mean anything at all to anybody, it must somehow relate to workload at a park. However, through a somewhat Arrow-like paradox, what is meaningful at the individual park level is not meaningful when it is aggregated to the system level. This is, of course, because visitors affect workload differently in different parks, and there is no common denominator like the dollar to reduce all this diversity to a comparable unit so that a single revenue or profit or return on investment figure can be calculated. So what do you do to comply with the Auditor General's direction?

3. Analytical and Theoretical Approaches to Defining Dimensions

You will have noticed that in this paper, we have avoided using the term visitation, a term which has often been used to describe the number of people who visit a park. The Concise Oxford Dictionary defines a visitation as an inspection by a bishop, or a divine dispensation of punishment or reward. We certainly welcome any bishops who would like to visit our parks, and auditors as well (there appears to be a part of the definition for each of them), but these kinds of visitations are only one dimension of park attendance. Our concern with the Auditor General's comments was that there were too many important dimensions to pick just one.

Dimensions are of course used in science and in common speech to describe things clearly and consistently. (Beaman and Grimm, 1989) Imagine a series of boxes, all of different sizes. We could go a long way to describing them merely by telling you their length, width, and height. The mathematically inclined among you will immediately see that we have characterised a them using a three-dimensional vector. Limiting ourselves to any one number or dimension to describe the boxes will give an incomplete picture. (see Cooley and Lohnes, 1961, for a factor analysis example)

Now "dimension" is often used very loosely in the social sciences, as in "the dimensions of a problem". It can however be used with rigour. Take a variety of variables that measure things that go on in a park, such as answers to a questionnaire. The values of these variables can be arrayed as a table or matrix. If there are 20 variables, any one set of 20 values for those variables (one respondent's questionnaire) defines a point in a 20-dimensional space. By factor analysis, one could determine how much of the variance in that space appears to be concentrated around one, two, or three, or a limited number of underlying factors or dimensions. (Harman, 1976 and Muliak, 1972).

Operations in a park can be "explained" by visits using just such a multi-dimensional model. Some sort of "complexity of operations" or "workload" variable could be specified as a function of a variety of other variables, as in the following:

> WORKLOAD = f (number of visits of various types, number of vehicles entering, number of picnics, length of stay of various visit segments, number and complexity of programs run for these visit segments, number of campers, ...)

If all these variables could be defined operationally (especially the dependent variable "workload", which has eluded us for many years), and appropriate data collected, a factor analysis could be run to reduce the variables to their underlying factors. In fact, we suspect there would probably be around three or four that would explain 90% or more of the variance.

What was just described was an analytic approach to finding dimensions. There has however been much reaction in the social sciences to applying methods without knowing what problem was to be solved (Beaman, 1977). The alternative to ad hoc use of methods is a theoretical approach, that is, an approach which identifies quantitative measures that are understandably related to the main aspects of the business that we are in, and that do not just duplicate each other. For example, the main business of some of our parks, and the item which absorbs the majority of the budget of those parks, is servicing the major highways that pass through them. The measurement of the number of entries by persons to that park, regardless of the purpose of their entry, provides an indicator that reflects a major workload of such parks. On the other hand, if we measure the number of people who stop in a park to do something, such as participate in a recreational activity or an interpretive program, we have a measure of another kind of workload, and it is "somewhat" independent of the number of entries.

Because there are as many ways to measure visitor behaviour as there are analysts to do it, the Auditor General's quest for a measure of attendance which is both valid and generalizable to all parks led us to make somewhat arbitrary selections from among the various alternatives available. Taking a general view, we reasoned, three things can happen at a park. A visitor passes through the park on his way to somewhere else, the park being a convenient travel corridor. A visitor stops for a brief time to participate in an activity (e.g., a picnic). A visitor stops for a significantly longer time to participate in a series of activities, often camping overnight. This kind of split provides a good general purpose way of presenting what happens. We are talking about very generalized behaviour when talking about reporting attendance for the Auditor General's purposes).

The time dimension can be tricky to capture here. It may be useful to split attendance into only two segments: those who enter just in order to pass through, and those who enter for park related purposes (heritage appreciation or recreation) for any period of time, long or short. Once the latter group is identified, it can then be measured two ways, by absolute number, and by some measure of duration, since clearly, the longer you stay, the more workload you represent, although here again the relationship is complex, regrettably ill understood, and of course, surrounded by myths.

The result of our considerations was a set of four measures: the person-entry, the person- visit, the person-visit-day and the person-visit-hour. A person-entry occurs whenever a person enters a park for any purpose. A person-visit occurs when a person enters a park for the first time on a given day or for the first time on the first day of his stay in the park, and his stay in the park is for the purpose of heritage appreciation or recreation, our mandated reasons for having the park. A person-visit-day occurs when a visitor stays in a park for a day or part day. Each day he or she stays counts as an additional person-visit-day. The person-visit-hour measure is used for visits to places like historic sites, where the visitor cannot stay overnight (there are no facilities provided for accommodation), but where different lengths of stay, ranging from minutes to hours, can be significant for management.

4. Testing Our Measures

Were our measures good ones? We tested the attendance data using factor analysis to see if we could reduce the number of variables from three. Then we submitted the data to cluster analysis to see if the measures provided any meaningful perspective on what was happening in parks.

To conduct these tests, we used person-entry, person-visit, and person-visit-day data for all national parks for the months of July and August for 1988, 1989, and 1990. For the purposes of this paper, we restricted ourselves to national parks. Since, as pointed out above, historic sites do not have overnight accommodation, have a length of stay of hours or minutes, and rarely have pass-through traffic, historic sites should be considered as different spaces, measured against different dimensions.

We have also limited the data in our example to the peak summer season (July and August). Some national parks do not operate in the winter. Others have radically different "operational" parameters in winter since accommodation, trail use, etc.,play a different role in park use at that season. The difference reflects both what can be offered and the different markets being served. We conducted a factor analysis on the three attendance variables person-entry, person-visit, and person-visit-day. Tables 1 and 2 show the results of two different factor analyses. The analysis in Table 1 shows the initial result.

Table 1. Results of factor analysis on untransformed variables.

VARIABLE	FACTOR LOADINGS		
	FACTOR 1	FACTOR 2	FACTOR 3
person-entry	0.92		
person-visit	0.97		
person-visit-day	0.98		
eigenvalues	2.769	0.213	0.019

All the variables load on Factor 1. One factor explains over 90% of the variance. However, it turns out that this is because the sheer scale of visits to parks overwhelms all other variation. Some parks receive as many as 650,000 person-visits in a month (with a commensurate number of entries and visit-days) while some parks get as few as 15 visits. Any subtle (or not so subtle) relationship between person-entries, person-visits and person-visit-days is wiped out by the fact that high attendance parks also have high person-entries and high person-visit-days as well.

We performed the factor analysis again on data transformed to make two of the variables "independent" of the third. We divided person-entries and person-visit-days by person-visits in order to turn them into the ratios "entry per visit" and "visit-day per visit". The results of the factor analysis are shown in Table 2.

We now had three variables. "Visits" showed the number of visits as before, with the influence of scale left in (high attendance parks still had big numbers; low attendance parks had low numbers). "Entries per visit" showed the proportion of entries to visits: where there was a great deal of pass-through traffic, the proportion of entries to visits should be high, regardless of whether the park had high or low attendance. "Visit-days per visit" indicated the proportion of long stays to one day visits: Where visitors stayed a long time, the ratio would be high; where visitors tended to stay only for a day, the ratio would approach one, again regardless of the scale of person-visits to the park.

Table 2. Results of factor analysis on variables transformed to eliminate effects of scale.

VARIABLE	FACTOR LOADINGS		
	FACTOR 1	FACTOR 2	FACTOR 3
entry/visit	-0.82	-0.06	
visit-day/ visit	0.41	0.78	
visit	0.55	-0.67	
eigenvalues	1.140	1.058	0.802

The factors with eigenvalues ranging from 1.1 to 1.06 to 0.80 show that if a reasonably large proportion of the variance is to be explained, three dimensions will be needed.

The conclusion is that there is no single relationship, particularly a linear one, that lets person-entries, person-visits, and person-visit-days be explained by each other. You cannot predict visits from entries by a general formula that applies to all parks. You can develop such a formula for a particular park for a peak summer season, but the formula will, at most, apply to a small group of parks that by chance have the same multipliers.

To see if we could use the three dimensions of attendance data to draw conclusions about how parks were behaving we used cluster analysis (Everitt, 1980). We ranked all the data using the "SAS PROC RANK" procedure and created a transformed normal distribution value for each ranked value using Tukey's algorithm. This is the same transformation as mentioned above, and had the result of eliminating the effects of scale. We then used the "SAS FASTCLUS" procedure to derive clusters from these transformed data. The results are shown in Table 3.

Table 3. Results of the cluster analysis.

CLUST #	N	CENTROID COORDINATES			CENTROID DISTANCE
		ENTRY/ VISIT	DAY/ VISIT	VISIT	
1	2	2.69	0.14	-2.69	2.21
2	13	0.80	1.92	-1.96	1.90
3	28	0.35	0.90	2.69	1.55
4	11	2.28	-1.60	-0.34	1.63
5	31	-1.68	-0.17	0.45	1.43
6	12	0.52	-1.60	1.12	1.03
7	26	-1.68	-2.69	-0.80	1.63
8	19	-1.68	1.17	-1.32	1.59
9	7	0.63	-0.75	-2.19	1.47
10	39	1.42	0.06	0.19	1.03

As can be seen from the centroid distances, a number of distinct clusters arose from the analysis. An easier way to understand this information is to list the parks which make up each cluster. This is done in Table 4. Recall that what were clustered were data from individual months, so it is possible for a park to appear in more than one cluster. It is a measure of the distinctness of the clusters that this "splitting" of a single park into several clusters occurred, with one exception, only to parks that are remote or extremely hard to get to, and so receive very few entries, visits or visit-days. The numbers in brackets are the number of months of attendance of a park that occurs in a cluster.

Table 4. Parks arranged in clusters.

CLUSTER 1: Northern Yukon (2)
CLUSTER 2: Auyuittuq (4), Northern Yukon (3), Ellesmere Island
CLUSTER 3: Banff, Jasper, Kootenay, Riding Mountain (4), Cape Breton Highlands
CLUSTER 4: Glacier (5), Mount Revelstoke
CLUSTER 5: Kejimkujik, Pacific Rim, La Mauricie, Kluane (1), Elk Island, Point Pelee
CLUSTER 6: Forillion, Prince Edward Island
CLUSTER 7: Pukaskwa (1), Kluane (5), Nahanni (1), Grasslands (2), Mingan Archipelago, St. Lawrence Islands, Wood Buffalo (4), Georgian Bay Islands (1)
CLUSTER 8: Pukaskwa (1), Nahanni (5), Auyuittuq (2), Prince Albert, Georgian Bay Islands (5)
CLUSTER 9: Pukaskwa (4), Northern Yukon (1), Wood Buffalo (2)
CLUSTER 10: Waterton Lakes, Yoho, Glacier (1), Riding Mountain (2), Fundy, Terra Nova, Kouchibouguac, Gros Morne

Anyone familiar with the Canadian Parks Service parks will have a good feeling about the groups as they are displayed above. Quite frankly, it was a surprise that we obtained this good a grouping from the attendance data. For example, Cluster two consists of very remote northern parks, with no roads, let alone any pass-through traffic. When visitors get there, they tend to stay for a relatively long time, and probably camp in the park. Cluster three consists of parks that have mixed use, with a lot of pass-through traffic, a lot of person-visits lasting only one day (e.g., skiing at Banff) but a lot of long stays for the world class attractions, particularly in Banff, Jasper, and Cape Breton Highlands. Cluster five parks can be characterised as end use parks, appealing mostly to regional residents who would use the parks over the weekends, but have very little pass through traffic. Finally, cluster ten consists of parks which have significantly more pass-through than five, but similarly attract a lot of regional short term visitors.

5. Uses and Limitations of Attendance Measures

Table 4 shows the clustering of the parks based on the three attendance dimensions. It should be noted however that what happens in some parks is a reflection of circumstances and not what was planned. CPS may have planned that the parks which happen to be in a cluster should in fact be quite different. Examination of target markets for each park in a cluster, and the "opportunity structure" for each park could well imply that different development options should be followed. This may be particularly true if sustainable tourism has become a driving objective for new development. The attendance measures may not provide enough information to allow an analyst or planner to define the clusters that parks should be in. They do , however, give a perspective on what is happening in the park. For general managerial tracking, the three attendance measures provide enough information to give some insight, but do not provide so much detail as to be unmanageable.

To answer the kinds of questions that might be raised, however, data beyond attendance must be examined. In the Canadian Parks Service, data that are to be regularly captured and monitored are being defined in a data plan for each park. The data plan must be based on the nature of the park and what is likely to happen to it. Furthermore, because money is scarce, the plan must be developed with due consideration of what is being collected anyway, what can be collected cheaply by automation, how accurate data must be and how often they need to be collected if they are to be useful.

What is wrong with combining the three measures to get one? In terms of the earlier discussion of the way to describe boxes, there are several ways to combine length, width and height, depending on what you want to do with the boxes. If you are going to keep liquid in them, you could combine length, width, and height into volume, and have a good measure. If you want to store solid objects in them, volume is a much less useful measure. If you want to minimize space wasted, then you have to know all three dimensions in order to match your objects with the correctly sized box. Therefore, what is the "best" measure depends directly on the problem you are trying to solve. In one park, person-entries can drop as person-visit-days increase. In another park, person-visits can increase as person-visit-days decrease. Person-entries to parks can rise and fall as exogenous factors influence the volume of pass-through traffic, yet a park's workload can remain unchanged. In another park, workload can primarily be determined by entries. All three measures are needed to provide a measure of attendance which will be useful for the variety of issues parks managers face. It is important to realize that the three measures are not selected on the basis of mathematical analysis. They were selected on the practical basis of being general yet useful.

6. Conclusion

The multi-dimensionality of attendance is a concept that can easily be applied to pool attendance, community centre attendance, festival and special event attendance and so on. This fact should be kept in mind when one sees a statistical report or an entire statistical system being designed around one statistic for each facility. Worse yet is a situation where the same statistic is reported for a variety of facilities or services regardless of its appropriateness to represent the work load of the facility or service. If management wants attendance measures that are consistently defined for different locations, and yet measure something remotely meaningful and useful, they must accept that they will have multiple measures which cannot be reconciled to a single "index" that gives an "overall" perspective on what is happening.

Attendance reporting is a political necessity. It can be little more than supplying numbers to meet political requirements. The emphasis of this paper has been that attendance can be consistent, relevant, logically justified and logically related to general data collection plans. It is to be hoped that more and more attendance reporting will be of the type just described.

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THE EFFECT OF TRENDS IN FOREST AND OWNERSHIP CHARACTERISTICS ON RECREATIONAL USE OF PRIVATE FORESTS

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Probit analysis was used to estimate correlations between recreational use of private woodland and forest, owner, and surrounding community characteristics. Land held by more highly educated owners or those reared in large cities was more likely to be used for recreation, while the opposite was true for land held by older owners.

Introduction

Forests provide opportunities for recreational and aesthetic relief from the pressures of modern society, as well as the raw material for a diverse wood products industry. Ownership changes are taking place that may drastically alter the flow of forest benefits.

Diamond International's recent sale of nearly 1 million acres in northern Vermont and New Hampshire focused attention on the public benefits associated with large undeveloped parcels. Fears emerged over the possibility, if not inevitability, that corporate restructuring and leveraged buyouts would bring extensive forest acreage, traditionally open to the public, to the auction block. Increased demands for recreation has led to overcrowding on many public lands. Recreational use is expected to become an increasingly important reason for owning woodland, particularly in the highly populated Northeast (USDA Forest Service 1989).

This study identified landowner characteristics associated with recreational use of nonindustrial private forest land. The influences of forest characteristics and population density in the surrounding community on recreational use were also examined. The results aid in understanding the effects of trends in landownership characteristics on recreational use of forests. Since landowners who use their land for recreation may manage differently, insight may be provided into a variety of forestry concerns.

Data and Methods

Information on forest characteristics were obtained for privately owned plots sampled in conjunction with the U.S. Forest Service's periodic survey of Vermont and ownership data were obtained from a questionnaire sent to the owner of each plot. Frieswyk and Malley (1985) and Widmann and Birch (1988) provide detailed discussions of survey techniques for the respective forest and ownership surveys. These data included species composition, elevation, proximity to a maintained road, parcel size, and owner characteristics, such as, age, education level, occupation, tenure of ownership, and whether the land was used for any of a variety of recreational pursuits (e.g. hunting, hiking, camping, bird watching or winter sports). Observations for 258 individually owned nonindustrial private ownerships were analyzed.

A nonlinear regression technique (probit) was used to estimate the relationship between a dichotomous dependent variable, coded "1" if the woodland was used for recreation and "0" otherwise, and variables measuring characteristics of the forest, owner, and surrounding community. Probit analysis provided estimates of the strength of correlations between recreational use and selected explanatory variables, as well as the probability that parcels with a given set of characteristics are used for recreation. Judge and others (1982) provide a thorough discussion of probit models.

Results

It appears that much of Vermont's privately owned woodland is used for recreation. Approximately 77 percent of the 258 sample plots were within ownerships that were used for recreation.

Table 1 provides a brief description of the variables and Table 2 shows the probit results and estimated elasticities. The signs for the coefficients indicate the direction of change estimated to result from an increase in an explanatory variable, but since the model is nonlinear, the magnitude of the change is influenced by the values for all the variables and coefficients. Elasticities estimate the percentage change in the probability that woodland is used for recreation resulting from a 1-percent increase in an explanatory variable, and those listed in Table 2 were evaluated at the mean values of the explanatory variables. The estimated probability that a parcel with characteristics equivalent to the sample means was used for recreation was 0.57. (See Tables 1 and 2, next page.)

Forest stands with larger portions of eastern white pine were more likely to be used for recreation. There is no clear intuitive explanation for this correlation other than preference for the aesthetic appeal of white pine or that white pine is more likely to occur on better drained sites. Other parcel characteristics examined but not statistically discernible at the 10-percent level included: size of ownership, proximity to a maintained road, per-acre timber volume, and several variables measuring species composition other than white pine. However, since forest characteristics were measured on only one plot per ownership and may not portray average conditions or indicate diversity, results with respect to forest characteristics should be used with caution.

Stronger correlations were found between landowner characteristics and recreational use. A strong positive correlation was found between recreational use and the landowner's level of formal education. Woodland held by owners who were reared in large cities also was more likely to be used for recreation. It appears that recreation is a more important reason for owning woodland for these owners than for those with a more rural background. Preliminary regressions provided weak evidence significant only at the 20-percent level, that farmers were less likely to use their woodlots for recreation.

Woodland held by older or professionally employed landowners was less likely to be used for recreation. These results were statistically significant at the 2.7-percent and 12.9-percent levels, respectively. Older owners may face physical restrictions, while professionals may have less free time or may prefer more developed types of recreation.

Several other ownership variables were examined but the correlations were not statistically discernible. Population density in the surrounding community, tenure of ownership, retirement status, and income levels were not correlated with recreational use.

Table 1. Definition of variables.

Variable	Definition
REC	Dependent variable, coded "1" if woodland is used for recreational purposes and "0" otherwise
PINE	Proportion of eastern white pine in stand
ED	Years of formal education
AGE	Age of landowner (years)
PRO	Variable, coded "1" if owner is employed in a white collar or professional occupation and "0" otherwise
CITY	Variable, coded "1" if landowner spent the first 12 years of his or her life in a large city (population > 100,000) and "0" otherwise

Table 2. Probit results and estimated elasticities.

Explanatory Variable	Coefficient	Standard Error	Mean		Elasticity
			Recreational Use	No Recreational Use	
Constant	0.511	0.613	1.00	1.00	-------
PINE	0.828*	0.432	0.13	0.06	0.05
ED	0.083**	0.028	14.90	13.00	0.60
AGE	-0.017**	0.008	55.58	60.51	-0.47
PRO	-0.308	0.204	0.42	0.41	-0.06
CITY	0.506*	0.302	0.19	0.07	0.04

N = 258
-2 LOG (Likelihood Ratio) = 26.63

** Significant at 5-percent level.
* Significant at 10-percent level.

Discussion

Several correlations were found between owner characteristics and recreational use of private woodland. Parcels held by more highly educated owners or those reared in large cities were more likely to be used for recreation. The opposite was true for land held by older individuals. Although trends show increases in the education level of landowners, the owners are also growing older as the baby boom generation ages. Baby boomers have generally been more active in their recreational pursuits than the preceding generation and may continue using their woodland for recreation as they grow older. The low estimated elasticities indicate that changes in the portion of forest land used for recreation, resulting from shifts in the characteristics of the landowning population will come about slowly.

Demands for both timber and recreation are expected to increase. Concerns over the loss of recreational opportunities on some large industrial holdings and intense use on many public lands may motivate more individuals to purchase forest land for recreation. Understanding the characteristics of these individuals provides insight into a variety of forestry concerns. Timber harvesting, forest management, posting, and participation in voluntary forestry programs have been linked to forest and landowner characteristics (Binkley 1981, Widmann and Birch 1988, Dennis 1989, Dennis and Sendak, in press). For example, more highly educated owners were less likely to harvest timber and more likely to post their land and participate in voluntary tax saving programs even when these programs required management stipulations. This suggests that voluntary tax relief programs that encourage timber harvesting and discourage posting may be effective in mitigating potential negative effects of changes in land ownership motivated by increased demand for recreation.

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WILDERNESS MANAGEMENT THROUGH VOLUNTARY BEHAVIOR CHANGE: AN EVALUATION OF THE PEMIGEWASSET WILDERNESS MANAGEMENT PLAN

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The management plan for the Pemigewasset Wilderness Area of New Hampshire represents a departure from traditional plans. Results of this study indicate limited evidence of the Pemigewasset Wilderness Management Plan (PWMP), as currently implemented, having a large direct impact on diverting hikers from their planned destinations and promoting dispersed usage and low impact camping.

Wilderness Management

The Wilderness Act of 1964 states that the principal value of wilderness is the protection of areas which "generally appear to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable" and that "it is the policy of Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness" (PL 88-577, Section 2A). A multitude of uses, outside influences, and legal mandates make management of the nation's 90,000,000 acres of wilderness areas necessary (Lucas and others 1985). While the Act establishes general guidelines for the management of wilderness areas, it leaves the development and implementation of specific management objectives to the individual federal agencies governing each designated area. Management techniques may be grouped into five broad areas (Lucas and others 1985): required permits; fees charged for area use; open access, with no fees or permits required; restricted use of certain areas; and open access systems which seek to voluntarily change use patterns. We focus on the last technique.

The Study Area

In 1984, 45,000 acres of the White Mountain National Forest in New Hampshire were designated by Congress as the Pemigewasset Wilderness, the largest tract in the National Wilderness Preservation System east of the Mississippi. Served by 11 trails totalling approximately 45 miles, the area is estimated to generate 19,000 recreation visitor days per year (USFS 1989).

In order to address the unique mix of historical and physical characteristics within the Pemigewasset Wilderness the management plan implemented by the Pemigewasset National Forest Ranger District divides the area into separate "zones," each with a specific management strategy. Areas where heavy use requires "active management to restore and maintain the wilderness condition" are designated as "Zone C" (USFS 1989). The implicit assumption made by the Forest Service is that dispersed usage is preferable to concentrated usage in meeting the Wilderness Act's goals. Previous studies have found that visitor usage is highly concentrated in most wilderness areas (Lucas and others 1985; Hendee and others 1978), that solitude is a quality sought by many wilderness users (Hampton and Cole 1988; Lucas and others 1985), and that the quality of the experience declines in the presence of other people (Lucas 1980; Roggenbuck and Berrier 1982). Hence, unmanaged use patterns are tending to cause the very situation that visitors to wilderness areas seek to avoid. An increasing number of studies have also suggested that the growing number of wilderness users are causing considerable physical damage to the natural resource (Cole 1989; GAO 1989). Based on this information, it appears that diverting overnight hikers to less traveled parts of the wilderness should increase total utility generated from the PWA.

The management plan for Zone C incorporates an innovative strategy with two components: 1) an active wilderness education program; and 2) a system of managed, designated, and dispersed camp sites. A central feature of the program is the use of "wilderness rangers" who promote dispersed camping, wilderness ethics, and the "no trace" camping ethic. These rangers contact hikers on the trail and provide information in hopes of persuading hikers to frequent less used areas and use lower impact hiking and camping practices, helping to mitigate many problems of overuse. Zone C is thus a "field school" where users learn low impact skills and wilderness values which can be carried to more remote parts of the PWA.

The Survey

In order to determine whether the PWMP was effective in altering backcountry users' behavior, a survey of area users was conducted in summer of 1989. The self-administered survey collected data on users' ages, incomes, environmental attitudes, reasons for visiting the area, and party characteristics. A total of 281 survey interviews were completed. Of these 281, 84 were hikers who had been contacted by wilderness rangers in Zone C; this group forms the basis for this analysis.

Information Obtained by Survey Respondents

A prime objective of the PWMP was to transmit information on low impact camping techniques and wilderness ethics. However, when asked to describe "helpful" information they received from the wilderness ranger, most respondents noted area- or trip-specific information such as camping sites (25.8 percent), weather (9.7 percent), points of interest (8.6 percent), and trail conditions (7.5 percent). Only one respondent (1.1 percent) related receiving helpful information on low impact camping techniques.

The Models

Prior to conducting the survey, two logit models were constructed to evaluate the effectiveness of the PWMP. The first or "behavior change" model examined the probability that respondents who had been contacted by a wilderness ranger changed their destination. Responses to the question "Did you change your original plans as a result of this (wilderness ranger) information?" ranged from not at all to slightly (dependent variable = 0) or moderately to greatly (dependent variable = 1). The second model, the "useful information" model, examined factors which determined whether respondents considered the information provided by the rangers as "useful." The question "Do you think that you will use this information on future trips?" similarly ranged from not at all to slightly (dependent variable = 0) or moderately to greatly (dependent variable = 1).

Previous research on characteristics of backcountry users has focussed on age, experience, occupation, education, gender, and group size (Leonard and others 1978; Echelberger and Moeller 1977). This information was used to guide selection of the models' explanatory variables: total number of hikers in party (TOTAL); number of children in party (KIDS); previous plans to stay at a designated tent platform site (1 if planned to stay at platform, 0 otherwise)(PLAT); number of previous visits to area (VISIT); age of respondent, in years (AGE); self-assessed experience of respondent (1 = beginner [EX1], 2 = intermediate [EX2], 3 [EX1 = EX2 = 0] = expert); education level of respondent (1 if college graduate, 0 otherwise)(EDUC); income of respondent, in $10,000 increments (INC); and likelihood of visiting the area again in next five years (1 if likely, 0 otherwise)(FUTU).

Results

The Behavior Change Model

Eighteen of the 84 respondents indicated that they had changed their destination as a result of the information obtained from the wilderness rangers. Results of the first model are presented in Table 1. Three variables--total number in party, likelihood of future use, and beginner-level experience--were statistically significant. The sign of the TOTAL variable indicates that hikers in large parties were more likely to change their destinations than those in smaller parties. This is an encouraging result, since diverting larger parties could substantially reduce environmental impacts in heavily used areas.

The sign and significance of the experience variable indicate that those with less developed camping skills (about 8 percent of respodents) were more likely than either intermediate or expert hikers to be influenced by the information provided. Backcountry users who were more likely to return (about 51 percent of the total) found the information influential in altering their destinations.

The McFadden R^2 of .193 indicates that the independent variables explain about 19 percent of the variation in the dependent variable. However, using a 50/50 criterion, the model predicts about 84.5 percent of responses correctly. (Under this test, predicted values of greater than .5 are assigned a value of 1, with 0 value otherwise. These assigned values are then compared to actual responses in the prediction success table).

Table 1. Factors influencing change in respondents' wilderness destination. Dependent variable = information provided caused respondent to change destination.

Maximum Likelihood Estimates			
Variable	Estimated Coefficient	Standard Error	Asymptotic T-Ratio
TOTAL	0.554	0.294	1.880*
KIDS	-1.508	1.130	-1.334
PLAT	-0.362	0.644	-0.563
FUTU	1.599	0.738	2.167**
VISIT	0.017	0.058	0.296
EX1	2.250	1.356	1.659*
EX2	1.235	0.907	1.361
AGE	0.005	0.037	0.147
EDUC	0.782	0.718	1.090
INC	0.139	0.159	0.874
CONSTANT	-5.499	2.111	-2.605***

* = significant at .10 level
** = significant at .05 level
*** = significant at .01 level
n = 84 McFadden R-Square: 0.193

Prediction Success Table

		Actual	
		0	1
	0	64	11
Predicted	1	2	7

Number of Right Predictions: 71.0
Percentage of Right Predictions: 84.5

Calculation of Probability Estimates

One of the attractive features of logit analysis is that it allows prediction of individual behavior based on different values of the independent variables (Capps and Kramer 1985). The probability that an individual with mean characteristics would change behavior due to information provided is approximately 14.3 percent. Thus, the information program is effective in diverting less than one-seventh of those contacted from their original destinations in zone C. When considering only experts (that is, EX1 = EX2 = 0, 21 of the 84 surveyed), the probability of changing destinations is only about 5.7 percent. Given these results, it appears that the PWMP is not very effective at redirecting hikers from Zone C.

The Useful Information Model

Despite the results of the behavior change model, the program might still be considered a success if hikers used the information obtained on future trips. If this were the case, over the long run dispersed usage might be achieved. For this reason, the model attempted to determine whether hikers would use the information provided by the wilderness rangers in the future.

Sixty-four of 84 respondents indicated that they found the information provided by the rangers helpful. As noted previously, however, most of this information was site- or area specific, and not directly related to the objectives of the PWMP

Table 2. Factors influencing usefulness of information provided. Dependent variable = respondent's perception that information was helpful.

Maximum Likelihood Estimates

Variable	Estimated Coefficient	Standard Error	Asymptotic T-Ratio
TOTAL	0.965	0.482	2.001**
KIDS	-0.531	0.573	-0.927
PLAT	-1.336	0.829	-1.612
FUTU	3.439	0.974	3.352***
VISIT	0.031	0.043	0.719
EX1	2.239	1.684	1.329
EX2	0.641	0.801	0.799
AGE	0.175	0.064	2.720***
EDUC	-1.447	1.008	-1.434
INC	0.139	0.163	-0.183
CONSTANT	-0.030	2.111	-2.605***

** = significant at .05 level
*** = significant at .01 level
n = 84 McFadden R-Square: 0.375

Prediction Success Table

	Actual 0	Actual 1
Predicted 0	11	6
Predicted 1	9	58

Number of Right Predictions: 69.0
Percentage of Right Predictions: 82.1

Results of the second model are presented in Table 2. A total of three variables were statistically significant at or beyond the .05 level: total number in party, likelihood of future use of the area, and age. The FUTU variable is especially interesting given the magnitude of its coefficient (3.44). About 51 percent of respondents indicated that they were likely to return to the Pemigewasset; hopefully, they will use the information received on these later trips. Older respondents and those from larger parties were more likely to find the information helpful. The sign of the platform variable implies that hikers who camp at the tent platform sites in the PWA are less flexible about changing their behavior. Unlike the behavior change model, the experience variables apparently play little role in determining whether the information provided will be used in the future.

The McFadden R^2 for the model was .375, indicating a moderate amount of explanatory power. Using the 50/50 criterion outlined in the preceding section, the model was able to successfully predict about 82 percent of the actual responses.

Calculation of Probability Estimates

Following procedures outlined above, the probability that an individual with mean characteristics would find the information helpful is about 90 percent. Further analysis of the results indicates that the program is more effective in influencing returning hikers. For hikers who answered that they were not likely to return (about 49 percent of the total), the probability of judging the information helpful was only 60 percent. When one considers the group likely to return, this percentage increases to nearly 98 percent. The differences in these two probabilities can be attributed to the area-specific information provided by the PWMP, which will not be used again by those not returning to the area. Finally, for the expert hiker group, the probability of judging the information helpful was about 82 percent, indicating that even expert hikers perceive benefits from the information provided.

Conclusions

Results of this study indicate that there is at best limited evidence of the PWMP, as implemented in the summer of 1989, having a large direct impact on diverting hikers from their planned destinations. Less than 20 percent of hikers contacted intended to change their camping destinations due to the information obtained from wilderness rangers. Respondents' accounts of what information received was "helpful" indicated that the information on low impact camping and wilderness ethics which will hopefully divert hikers from heavily used areas is not being transferred, a conclusion reinforced by logit results. This may indicate a need for changed emphasis in the information provision techniques of the wilderness rangers. Despite this, there is evidence of a substantial amount of information being disseminated to users of the PWA. Similarities among PWA and other wilderness area users (see Brown and others 1991) indicate that what is successful in the PWA may well prove successful elsewhere. It seems evident that the PWMP is effective at information provision on the area; whether this proves effective in managing our wilderness areas remains to be seen.

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USE OF PAIRED MANAGEMENT ACTION GRIDS FOR EASE IN DEPICTING DIFFERENCES BETWEEN USERS' AND MANAGERS' PERCEPTIONS OF PROBLEMS

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This research was to determine whether differences exist between users and managers concerning perceptions of actual and perceived problems in parks and primarily to present a method of graphically depicting the differing perceptions of problems which exist between users and park managers which can be easily employed by area managers and related to the public, upper management and governing bodies.

Introduction

The purpose of this research was to determine whether differences exist between users and managers concerning perceptions of actual and perceived problems in parks. One point of significant interest generated by this study was the graphic depiction of the differing perceptions of problems which exist between users and park managers. A growing body of research findings demonstrates that significant differences exist between users' perceptions and preferences and management's perceptions of users' preferences regarding recreational opportunities and support services (LaPage, 1983; Harris, 1979; Driver, 1974; Peterson, 1974; Moeller et.al., 1974; Clark et.al., 1971; Hendee and Harris, 1970; Lucas, 1964). As shown by Hendee and Harris (1970) and Moeller et. al. (1974) the attitude that the manager is eminently qualified to make decisions concerning users' needs on the basis of the manager's knowledge, without adequate input from the users, is often erroneous. These authors have shown that managers' perceptions concerning users' desires for services are not compatible with the users' actual expressed desires. Without sufficient data sources and input, the managers cannot efficiently allocate resources to address users' service needs.

There are a number of studies which deal with user expectations from a recreational experience and setting (Wagar 1966; Shafer 1969; Hancock 1973) and an abundance of literature on how a manager can provide these services (Lime 1971; Wagar 1966; Fish and Bury 1981; Lime and Stankey 1971; Clark et. al. 1971; and Hendee and Harris 1970). There is also a significant body of literature which describes the manager's perceptions of the recreation setting and how he executes his job of providing recreation services (Lime and Stankey 1971; Wicker and Kirmeyer 1976; Philly and McCool 1981; and Wadzinski 1983).

A growing body of research demonstrates that significant differences exist between users' perceptions and preferences and managers' perceptions of user preferences regarding recreational opportunities and support services (Lucas 1964; Hendee and Harris 1970; Peterson 1974; Driver 1974; Harris 1979; LaPage 1983). Lime and Stankey (n.d.) proposed that "... what the recreationist perceives as acceptable or desirable may be quite different from what the manager perceives." As LaPage (1983) states: "... there is a growing mountain of evidence of substantial differences between managerial and user perceptions...". The question which plagued Lime and Stankey's research (n.d.) was: "Whose values are to count most - the managing agency's or the public's?" If public values are to be relied upon, which 'public'? - there are so many of them!" There is no such thing as an "average recreationist", so management must make decisions concerning services to be offered and how to manage areas for the greatest range and number of users desired (Wagar 1966; and Shafer 1969).

Hendee and Harris (1970) found in a study of foresters' perceptions and attitudes and of users perceptions and attitudes that managers did not have an accurate perception of users' attitudes and perceptions. This study was limited to how managers felt users would respond to various policy and behavior rules in wilderness areas. It was found that, while foresters responses were similar to users responses in their personal perspective of wilderness, they were found to be significantly different in their perceptions of user attitudes concerning wilderness. The authors suggested that:

> "These misperceptions of user attitudes suggest limited exposure to typical users and bias from excessive contact with organized conservationists and comfort seeking users commanding attention as well as selective perception based on differences between managers and users."

The management sample in this study was restricted to upper level managers, those individuals not directly involved with the day-to-day operations of wilderness areas, who made management decisions based on information passed up to them by their staff or from input from vocal special interest groups. This study did not consider the line manager who was actually dealing with users on a day-to-day basis and was responsible for on-site response to user problems. Thus, these researchers attributed bias in decision making to the upper level managers without considering on - site management.

In 1974 a study was completed on the "Opinions of Campers and Boaters at an Allegheny Reservoir". This study addressed a wide range of considerations including fees, law enforcement, recreational zoning and facility development. The area managers responsible for decision making were surveyed and perceptions of these managers were again, as in the Hendee and Harris study, found to be significantly different from the perceptions of campers and boaters (Moeller, Larson and Morrison 1974). Another apparent phenomenon in this study was that significantly different perceptual responses were elicited from users pursuing different types of recreation activities. This further supports the statement that there is no such thing as an "average recreationist" (Wagar 1966; Shafer 1969; Moeller, Larson and Morrison 1974).

To offer services desired by users, a manager must first be aware of what the users want and be willing and capable of offering those services. According to Driver (1974), managers, when consulted, often respond that they are aware of the data collection techniques required to ascertain user expectations and what constitutes user satisfaction. However, because of time and money constraints, most managers related that they cannot

afford to collect and analyze the data necessary so they often rely on their "gut" feelings when making decisions. As Driver and Knopf (1981) state;

> "... Individuals attracted to the managerial profession tend to be less abstact and more "down-to-earth (than researchers) and like to deal with more tangible things. As a rule, they have less interest in things that are uncertain, unpredictable and abstract. They need an environment that is clearcut and familiar. The solution to problems must be more immediately evident, and they tend to seek immediate results from their efforts."

Managers state that they are "recreation professionals" who deal with users and park problems daily. On the basis of their training and continued exposure to these problems they maintain that they are adequately informed to make decisions about what the users want, and what will satisfy the users within the framework of their individual park situations and budgetary constraints, without expensive, time-consuming research (Driver 1974; Wicker and Kimmeyer 1976).

As shown by Hendee and Harris (1970) and Moeller et. al. (1974) the attitude that the manager is eminently qualified to make decisions concerning users' needs on the basis of the managers' knowledge, without adequate input from the users, is often erroneous. These authors have adequately shown that managers' perceptions concerning users' desires for services are not compatible with the users' actual expressed desires. Without adequate data sources and input, the managers cannot efficiently allocate resources to address users' service needs.

Methodology

Two study populations were considered in this research. The first consisted of a sample of March 1984 "Spring Break" users at Port Aransas City Beach Park on North Padre Island on the Texas Gulf coast. The population of managers included all beach park managers who had responsibility for implementing policy concerning problems at the beach during "Spring Break" 1984.

A total of 187 beach users and 10 managers were interviewed during the one week study period. Only four (4) users (2%) of the 191 persons selected for interviews, declined to be interviewed. Thus, the user response rate for this study was 98%. All ten (10) managers agreed to the interview. Thus the manager response rate for this study was 100%.

To develop an instrument to collect data which would adequately answer the research, data needs were first determined. To provide a field of valid research questions which would provide viable data for analysis, a number of previously completed research studies which addressed similar objectives were reviewed, and a set of possible questions were assembled for inclusion into the survey instrument.

The questionnaire was designed to evaluate: (1) the importance of beach services & facilities, and (2) the perceived performance of the managing agency in providing those services & facilities. The seven response choices for the importance rating were presented in a Likert-type scale and ranged from "extremely important" to "not important at all". Respondents were also asked to "grade" or rate the performance of the beach managing agency in providing each service & facility. Response choices for performance ranged from a grade of "A" (outstanding) to "F" (totally unacceptable).

Treatment of the Data

A one-way analysis of variance (ANOVA) was performed on th response data which was gathered on the surveys. Data for all questions included in the survey were analysed using a contrast of responses to each individual question between the user sample and the manager population. The ANOVA determined whether there were statistically significant differences in response means for each question between groups. Statistical significant differences were tested in this study at the .05 alph level (Ott 1980; Weisberg and Bowen 1977).

Findings

Beach users' and managers' perceptions were compared to identify statistically significant differences in responses. "Perceived Importance and Performance of Services Provided", the paired service delivery items, showed that users and managers at Port Aransas City Beach Park had statistically significant differences in perceptions on fifteen (15) items. F each of the items the managers' responses were higher than th users (See Table 1, next page).

The use of paired Management Action Grids can graphically reproduce the statistical findings (Figure 1). This method uses three-step process to evaluate an existing marketing strategy to develop a new strategy. First, a set of attributes or features identified through a literature review, focused group interview and the use of managerial judgement (Martilla and James 1977

Second, consumers or users are asked two questions about each attribute or feature: (1) "How important is it" (2) "How well did the provided product or service perform in satisfying their expectations?" The third step involves calculating importan and performance scores for each attribute or feature.

The importance and performance scores are calculated by assigning a numerical code to each response (i.e., a five point scale with "5" being a high score and "1" low), summing the numbers and dividing by the "n" (total number of responses). These resultant scores are the statistical mean responses for importance and performance.

These scores provide "x" and "y" coordinates which are then plotted on a two dimensional scale termed the "Action Grid" (Blake et al. 1978). When plotted, the two axes ("x" & "y") divide the grid into four quadrants (Figure 1). The upper right quadrant contains responses to those services or features whi are perceived to be important to the respondent and which the respondent believes are being adequately provided by management. Items which fall into this area require little or attention by management. The upper left quadrant includes responses to those services which are perceived to be import to the respondent but which are not being adequately addresse by management. Items which fall into this area require attention by management so improvement can be made to be satisfy the users. The lower right quadrant includes response those services which are perceived to be unimportant to the respondent and which are being well provided by managemer Services which fall into this quadrant require less attention ar resources. These resources may be re-assigned to improve services in the upper left quadrant. Finally, the lower left quadrant includes those services which are perceived to be unimportant to the respondents and which are poorly provid by management. Items which fall into this quadrant do not require much attention from management due to the low prio in the opinion of respondents. Attention and resources shou only be allocated to services which fall into this quadrant aft much more important services are adequately provided. A second grid containing managers responses was prepared by

Table 1. Differences in perceptions between beach park managers and users at Port Aransas City Beach Park to questionnaire items related to perceived importance and performance of services at the beach

Type of Service	Mean	2 - Tail Probability
1. Lifeguards	*Importance*	
Users	3.31	0.010
Managers	4.44	
	Performance	
Users	1.54	0.006
Managers	3.50	
2. Enforcement patrols	*Importance*	
Users	4.24	0.004
Managers	5.20	
	Performance	
Users	3.78	0.000
Managers	4.67	
4. Public telephones	*Importance*	
Users	4.01	0.049
Managers	4.78	
	Performance	
Users	2.39	0.031
Managers	3.63	
6. Emergency first aid	*Performance*	
Users	2.66	0.002
Managers	4.33	
7. Traffic control	*Performance*	
Users	3.14	0.022
Managers	3.89	
8. Camping sites	*Importance*	
Users	4.04	0.033
Managers	4.78	
9. Crowding	*Importance*	
Users	2.72	0.010
Managers	3.89	
13. Hotels/motels	*Performance*	
Users	3.84	0.025
Managers	4.38	
14. Restroom/showers	*Performance*	
Users	2.70	0.029
Managers	4.13	
15. Staff friendlyness	*Performance*	
Users	3.70	0.001
Managers	4.63	
16. Facilities well maintained	*Performance*	
Users	3.14	0.002
Managers	4.38	
19. Clean swimming area	*Performance*	
Users	3.45	0.009
Managers	4.38	

above mentioned methods for comparison with the users' grid and placed with the users' grid.

The Management Action Grid was easily adapted for the purpose of this research since it graphically presents to management the preferences and perceptions of users. Figure 2 graphically reproduces the statistical findings of Table 1. These graphics further identify and exemplify the dramatic gulf which exists between managers and users perceptions and suggest management responses to remedy these shifts. When responses between perceptions of management and users are compared, management can determine the degree to which differences exist, whether managerial action is warranted, and what specific concerns should be addressed. By using the grids as a guide for reassigning resources, management can better address the problems important to their respective user clientele.

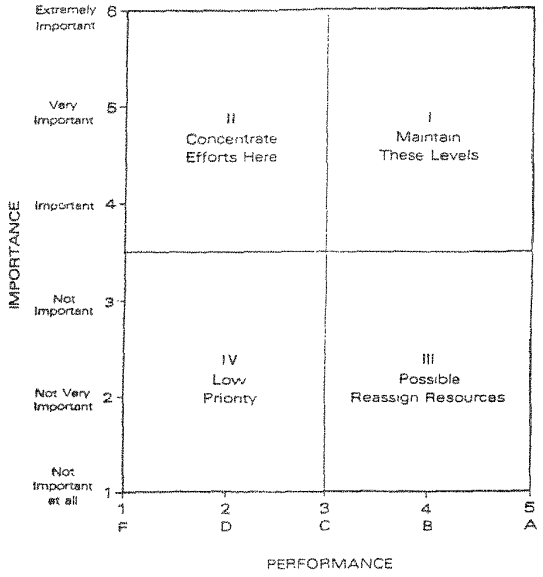

Figure 1. Importance Performance "Management Action Grid."

Summation

This study revealed that the perceptions of users, concerning actual and perceived problems, were significantly different from managers perceptions, thus supporting previous research findings. This importance-performance analysis has become increasingly popular for measuring consumer acceptance of product attributes in a variety of fields (Duray and Crompton 1983). From the standpoint of managers, this system is very easy to use as it requires a fairly simple questionnaire format which employs paired responses. The questionnaires employed can be very simple and may be easily administered in on-site personal interviews, on-site individual self-administered surveys or by mail returns. The need for computer and/or statistical expertise is minimal and the final presentation of the data in graphic form is easily understandable, which enables the user to present the data to groups of their superiors, local politicians, and/or consumers, with ease and without confusion (Guadagnola 1983).

The projected end result of this research was to assist managers in other park settings to realize that differences exist between managers' perceptions and their users' perceptions of problems and to provide a tool which can be easily adopted by today's managers to identify, communicate and correct problems. By better understanding the concerns of a park's users, managers can more effectively assign priorities, manage limited resources and achieve a more positive rapport with the public. The method employed by this research should be easily replicable by managers in other park settings to identify similar problems with the ultimate goal of reducing the differences in the actual and perceived concerns of managers and their area users.

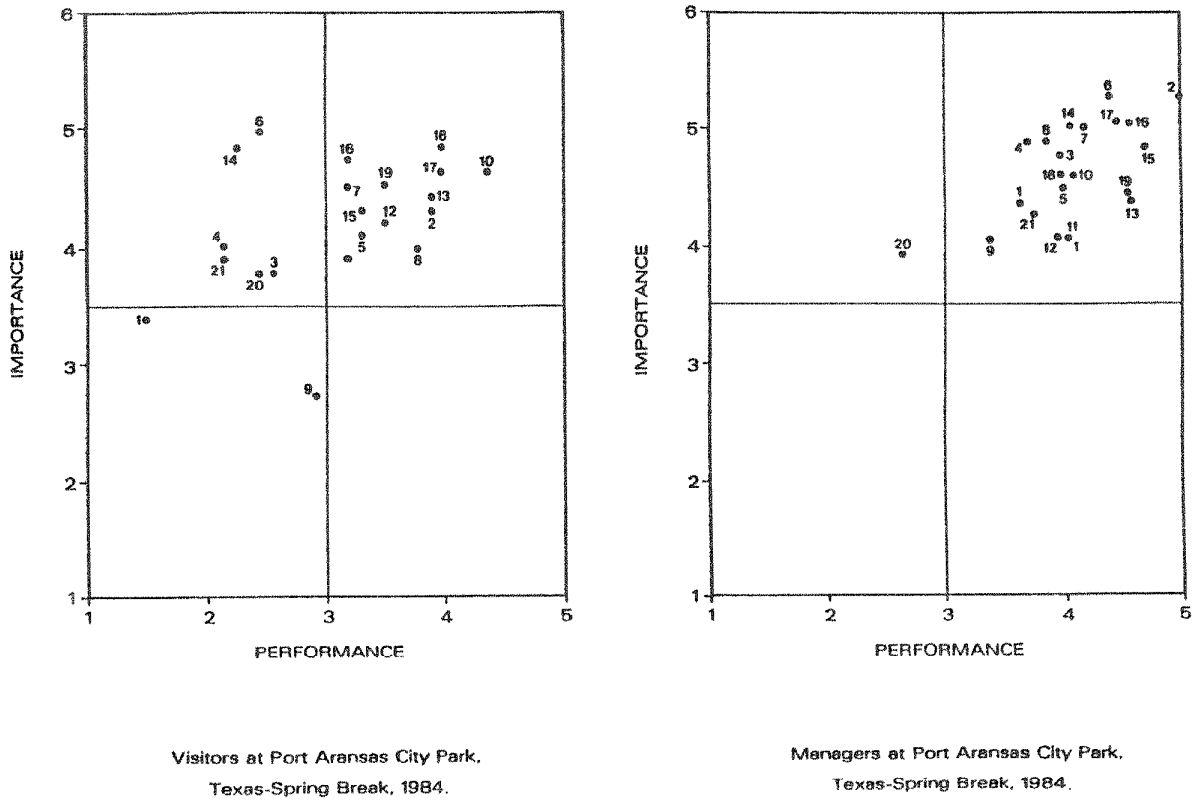

Figure 2. Paired management action grids: Importance vs. performance of services at Port Aransas City Beach Park.

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